Issued March 8, 1912.

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE STATE OF MISSISSIPPI, E. F. NOEL, GOVERNOR; E. N. LOWE, DIRECTOR, STATE GEOLOGICAL SURVEY.

SOIL SURVEY OF LAUDERDALE COUNTY, MISSISSIPPI.

By HUGH H. BENNETT and HOWARD C. SMITH, of the United States Department of Agriculture, and W. M. SPANN, E. M. JONES, and A. L. GOODMAN, of the Mississippi Geological Survey.

HUGH H. BENNETT, Inspector in charge.

[Advance Sheets—Field Operations of the Bureau of Soils, 1910.]

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1912.

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LETTER OF TRANSMITTAL.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., August 9, 1911.

SIR: Under the cooperative agreement with the State of Mississippi one of the projects in the soil survey of the field season of 1910 was the surveying of Lauderdale County. This is a region of varied soils, and the opportunity for diversification of crops is particularly marked. Already there is a tendency among the better class of farmers to adopt more modern methods of cultivation, including rotation, the use of green manuring crops, and the careful selection of seed. The accompanying report and map should afford these farmers and others desirous of improving their conditions a basis for proceeding intelligently in the work of adapting their soils to crops and in making the greatest profit from their lands consistent with the maintenance of productiveness.

I have the honor to recommend that the accompanying manuscript report and map be published as advance sheets of Field Operations of the Bureau of Soils for 1910, as provided by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. JAMES WILSON,
Secretary of Agriculture.

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SOIL SURVEY OF LAUDERDALE COUNTY MISSISSIPPI.

By HUGH H. BENNETT and HOWARD C. SMITH, of the United States Department of Agriculture, and W. M. SPANN, E. M. JONES, and A. L. GOODMAN, of the Mississippi State Geological Survey.

DESCRIPTION OF THE AREA.

Lauderdale County, Miss., is one of the eastern tier of counties bordering Alabama. Surrounding it are Kemper to the north, Sumter and Choctaw Counties, Ala., on the east, Clarke on the south, and Newton to the west.

The area surveyed is 708 square miles, or 453,120 acres. The boundaries, with the exception of that on the east, are marked by straight lines at right angles. The county is located approximately between parallels 32° 35′ 15″ and 32° 12′ 12″ north latitude and meridians 88° 24′ and 88° 54′ 48″ west longitude. In form it is a parallelogram approximately 30 miles in length east and west and averaging 23 miles from north to south.

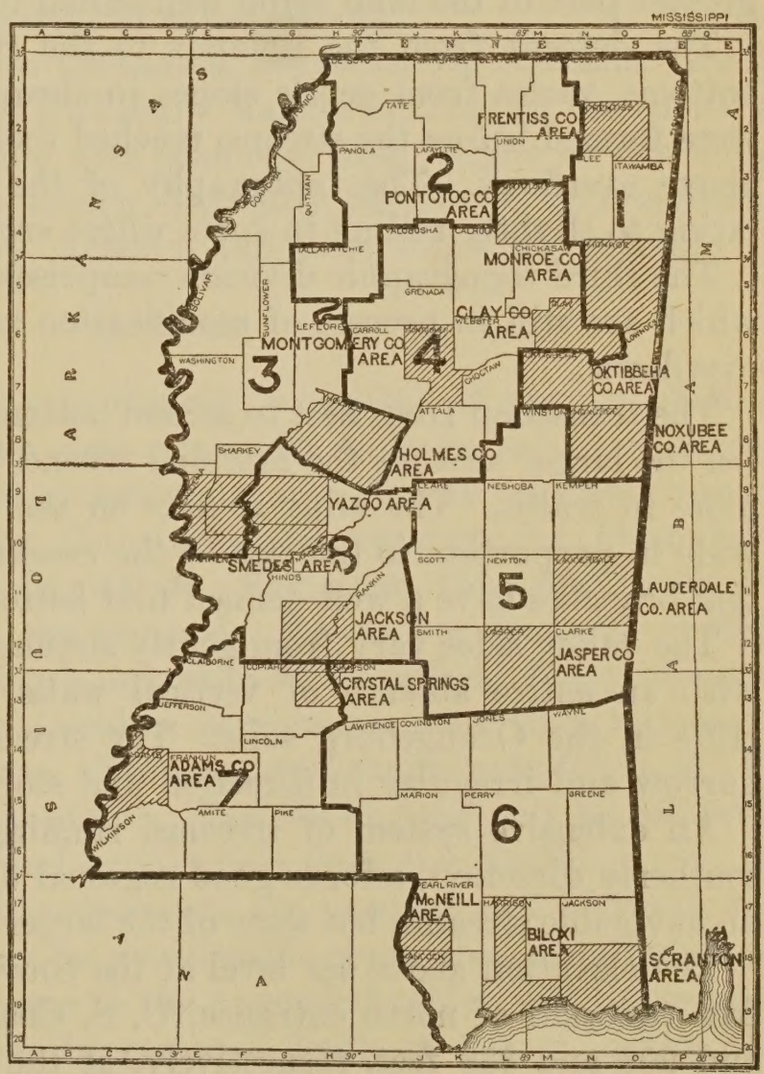

FIG. 1.—Sketch map showing location of the Lauderdale County area, Mississippi.

Lauderdale County lies entirely within that broad physiographic division known as the Gulf Coastal Plain. It embraces three topographic divisions: (1) the uplands, comprising sands, silts, clays, and gravels, in part marine and in part freshwater deposits, ranging in age from the Cretaceous to the end of

the Tertiary; (2) second bottom, or alluvial terraces, deposited when the streams were flowing at higher levels; and (3) the broad, alluvial first bottoms of streams subject to frequent overflow.

The surface features of the upland portion vary with the location. The northern section of the county is rolling to moderately hilly, broken by occasional high hills and broad-bottomed valleys. Westward from Suqualena and southward from Meridian the surface is characterized by broken series of hills and sharp ridges ramified by an intricate system of streams and valleys. The roughest topography of the county finds expression in the Lauderdale and Guin soils and the erosion phase of the Orangeburg sandy loam, which are developed in this section and in the western portions of the county. Even in this section there are occasional nearly flat to gently rolling plateaulike areas well suited to agriculture. Elsewhere the uplands vary from almost flat or undulating to rolling or slightly hilly, the greater part of the land being well suited to cultivation.

The descent from the uplands to the stream terraces, or second bottoms, varies from gentle slopes to abrupt breaks. These terraces were formed before the streams reached their present levels and stand above overflows. The topography of the second bottoms is undulating to slightly rolling in spots where erosion has been most active.

The third topographic division comprises the alluvial first bottoms, which are still in process of modification and formation by frequent overflows.

The transition from first to second bottoms is usually very gradual. On the larger streams the first and second bottoms may be a mile or more in width. The alluvial flats on the smaller streams are quite wide in proportion to the size of the creeks, and nearly all intermittent branches have a well-defined first bottom.

The valley sides vary from gently sloping to very steep and rough, with an entire absence of vertical walls, excepting the occasional cliffs in the Orangeburg soils. The stream divides are frequently narrow and irregular in direction and slope.

An extensive system of streams, running for the most part in a southerly direction, affords good regional drainage. The county has no navigable streams, but some of the larger creeks afford some power.

The elevation above sea level at the courthouse in Meridian is 344 feet (doorsill of north entrance, U. S. Coast and Geodetic Survey), and 208 and 358 feet, respectively, at the Mobile & Ohio Railroad stations of Lauderdale and Marion. Toomsuba, on the Alabama Great Southern Railroad, has an elevation of 286 feet.[1] Considerably higher elevations than these are attained in various parts of the county, notably in the hills and ridges south and west of Meridian.

[1] These figures were taken from Bulletin No. 274, U. S. Geological Survey.

The conspicuous hill in sight of Meridian to the south, which is locally called "the Mountain," commands a wide view of the surrounding country. The top of this is about 200 feet above the courthouse at Meridian.

Prior to 1825 the Choctaw Indians inhabited the county and cultivated the first and second bottom soils near Marion. The first settlers came from the older Southern States in 1832, locating near Lizelia, Alamucha, and Okatibbee. There has been little foreign immigration, and the present inhabitants are mainly descendants of the original settlers.

In 1910 the county had a population of 46,919, about equally divided between whites and negroes. In 1900 there were 38,150 inhabitants, of whom 19,190 were negroes.

Ieridian, the county seat, is an important railroad terminal, and has a large number of manufacturing establishments supplying cottonseed oil and fertilizers. There are numerous colleges in the county and an excellent system of rural schools.

The Mobile & Ohio, New Orleans & Northeastern, Alabama Great Southern, and Alabama & Vicksburg Railroads traverse the country in several directions, giving fast passenger and freight service with Mobile, New Orleans, Vicksburg, Memphis, St. Louis, Birmingham, Chattanooga, Montgomery, Atlanta, and other important markets.

CLIMATE.

The climate of Lauderdale County is typical of regions of like latitude and removed from close proximity to large bodies of water. The extremes of winter temperature are modified by southerly winds from the Gulf of Mexico, the average temperature for December, January, and February being 48° F. Variations from zero to 80° F. have been recorded, but are unusual. Frosts are frequent during the winter, and occasionally a thin skim of ice or light flurry of snow is recorded. Freezing cold seldom persists for more than two days, when the weather moderates. Temperatures range from 40° to 50° F. during the day, with crisp nights. Periods of frost may be followed by rain, colder weather, and brisk winds from the North.

Extreme variations of temperature are unusual and of short duration, although there may be considerable seasonable variation from the figures given as averages in the appended tables. In the winter months the soil sometimes freezes to a depth of 1 or 2 inches, but rarely remains so for more than a day or two at a time. The winter rainfall averages 16.3 inches, coming usually as steady general rains from the southwest and frequently flooding the bottom lands.

The table following gives the normal monthly, seasonal, and annual temperature and precipitation at Meridian.

Normal monthly, seasonal, and annual temperature and precipitation at Meridian.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.	Snow, average depth.
	°F.	°F.	°F.	Inches.	Inches.	Inches.	Inches.
December	49	76	9	5.1	2.7	3.3	0.2
January	46	79	12	5.0	5.0	2.4	.3
February	48	80	−6	6.2	13.3	7.6	1.4
Winter	48			16.3	21.0	13.3	1.9
March	56	85	17	5.8	4.4	4.5	T.
April	64	90	28	4.0	1.4	15.0	.0
May	72	95	41	4.3	1.4	1.6	.0
Spring	64			14.1	7.2	21.1	T.
June	78	98	46	5.5	3.2	20.1	.0
July	80	104	59	5.3	6.7	3.1	.0
August	79	100	49	4.4	4.6	2.3	.0
Summer	79			15.2	14.5	25.5	.0
September	74	96	39	3.0	.1	2.5	.0
October	63	90	29	1.8	1.0	5.2	.0
November	54	82	18	3.0	.7	4.4	T.
Fall	64			7.8	1.8	12.1	T.
Year	64	104	−6	53.4	44.5	72.0	1.9

The change of seasons is not marked by abrupt climatic variations. The spring months of March, April, and May, with an average temperature of 64 and rainfall of 14 inches, are seasons of pleasant weather, favorable to plowing and seeding. Hailstorms are almost unknown, but thunderstorms are frequent, the rain falling rapidly and in marked contrast to the general rains of winter.

Summer and fall are mild, pleasant months of steady but not extreme heat. On only a few occasions during the past decade has the temperature exceeded 100° F. The average temperature for June, July, and August is 79°. In comparison, Johnstown, Pa., has an average of 71° for the same months. The winters are much less severe than in the Northern States, while the average of the summers is only slightly higher. The highest recorded temperature in Meridian is 104°. This remarkable uniformity of climate is the more apparent when it is considered that the difference between the average temperatures for June, July, and August, and December, January, and February is but 31° F. The average temperature for the year is 64°, for July 80°, and for January 45°. There are on the average 48 days with a temperature above 90° and 39 days with a temperature

below 32°. There are approximately but 5 days in the year when the mercury drops below this figure, to 22°.

The extreme dates of first frost in fall and last in spring are October 8 and April 25, respectively. The average date of first and last frost occurrence, based on 21-year records, is March 26 and October 31. The growing season for tender vegetation is 229 days, or nearly 8 months. This gives more than ample time to ripen all ordinary farm crops. With an intensive system of truck raising this would make it possible to raise two or three crops on the same field each year. Under this system irrigation could be employed to advantage to make late crops certain. On many of the larger streams inexpensive irrigation plants could be easily installed.

There are few damp, foggy days, and the percentage of sunshine, particularly in the winter, is very high. The average number of clear days is 138; partly cloudy, 128; and cloudy, 99. The prevailing winds are from the southwest and the average velocity is 5 miles per hour. In winter the prevailing winds are from the north, in the spring from the south, in the summer from the southwest, and in the autumn from the northeast.

From the above data it appears that the winter favors the growth of hardy pastures and winter vegetables and affords sufficient sunshine to ripen greenhouse plants and flowers. The freedom from great extremes of temperature favors dairying, stock raising, and poultry keeping, making trucking and the development of an intensive system of farming possible.

AGRICULTURE.

AGRICULTURAL DEVELOPMENT.

The development of Lauderdale County from its early settlement has followed practically the same lines that have characterized the agricultural progress of this general region. In the beginning a patchy agriculture prevailed, including the production of crops needed for the sustenance of the family, with a small surplus for market. Cultivation was crude and manurial applications rarely made. Corn, rice, sweet potatoes, oats, peas, and beans soon became the most important crops. Some hogs and cattle were also raised by the early settlers. The value of live stock according to the census of 1850 was $370,431. Ten years later live stock was valued by the census at $657,607, but under the devastating influence of the Civil War the valuation dropped by the end of the next decade to $284,179. Following this there was a widespread resumption of agricultural activities. The valuation of live stock was placed at $303,885 by the census of 1880 and at $422,170, $623,959, respectively, by the censuses of 1890 and 1900.

In 1850 there was grown 4,195 bales (400 pounds each) of cotton. By 1860 the production had increased to 12,700 bales. In 1869 it declined to 3,683 bales. After this the crop showed a rapid increase; in fact, it has been and is now decidedly the most important crop grown. In 1879 the yield of cotton was 9,350 bales, which advanced to 12,845 bales in 1889, to 16,496 in 1899, and to 17,469 in 1910.

Corn production has varied according to the census reports as follows: 1850, 324,459 bushels; 1860, 478,271 bushels; 1870, 140,250 bushels; 1880, 254,798 bushels; 1890, 324,807 bushels; and 1900, 479,460 bushels. It is thus seen that the two most important crops, cotton and corn, have shown a steady advance, as marked by the amount produced, from the beginning of the two stages in the agricultural development of the region—the ante bellum period and the period marking the reorganization (about 1870) of industry subsequent to the tremendous collapse occasioned by the Civil War.

Although the census of 1850 shows that 102,203 pounds of rice and 2,808 bushels of wheat were produced in the county, these crops are not mentioned in the succeeding census reports, and neither was seen growing during the progress of the soil survey in the summer of 1910. A glance at the census reports shows a wide variation in the annual production of oats. The figures as given by the several census reports are as follows: 1850, 21,771 bushels; 1860, 2,001 bushels; 1870, 8,389 bushels; 1880, 57,843 bushels; 1890, 36,680 bushels.

From the earliest days sweet potatoes have held an important place among the crops, principally for home use. The census of 1850 gives the production as 111,444 bushels. Sugar cane and sorghum for table sirup, peaches and figs, Irish potatoes, melons, and a number of the ordinary garden vegetables, cowpeas, and peanuts have also been grown in a small way, mainly for use on the farm. Recently some of these crops, especially sugar-cane sirup, vegetables, melons, and peaches, have become more important and are being grown for local markets and for shipment to outside points. A number of carloads of peaches were shipped in 1910.

It is proposed to emphasize here the opportunities for a greater diversification of crops, as well as to point out the lines along which improvements can be made in the handling of crops now grown.

DIVERSIFICATION OF CROPS.

Lauderdale County with its varied soils is capable of producing a wide range of crops. At present, despite the large number of crops grown, only a few have recognized places of importance in the agriculture of the area, a fact certainly not chargeable to a scarcity of land well suited to the production of crops other than the few staples now produced.

That cotton has been the support of the agriculture of this region, the money crop upon which farmers have depended almost since the first settlement of the county, is but the natural outcome of the admirable adaptation of the soils to the crop. The ease with which it is grown, coupled with an increasing demand for both lint and seed at prices always sufficiently high to insure at least a comfortable living to the grower, has naturally given it an important place among crops. Its popularity has been further increased through the possibility of its production year after year without causing rapid decline in the productiveness of the soil. It is not the purpose of this report to advise a cessation of cotton production. As a matter of fact, an investigation of the soils of the county has pointed to the wisdom of a continuation of cotton growing, though under a somewhat different system than has prevailed in the past, a system of diversified cropping to meet the demands of changed conditions. Diversification of crops along well-directed lines must result in a more profitable agriculture, suited to the varied soils of the county, to the maintenance of their productiveness, and to the combating of the boll weevil, which threatens invasion at no distant day. A gradual improvement along the line suggested is already taking place in the farm methods of this section.

The cotton crop of this year (1910) has been a profitable one, good prices having been secured. The production of 50, 60, and even 100 or more bushels of corn per acre in prize contests is having a widespread influence in improving the methods of corn culture. Farmers are taking more interest in the selection of seeds; they are giving more and more attention to the fertilizer problem, to crop rotation, the benefit to be derived from deeper soil preparation and the production of leguminous crops, like cowpeas and velvet beans.

There is room for further improvement, and this applies to the greater part of the county. The survey of the soils of Lauderdale County was undertaken in an effort to hasten the improvement that has already begun—to furnish a guide in using the different grades of land more in accordance with their crop adaptations. Most farmers recognize that there are differences in the productiveness of soils as well as in their crop adaptations and cultural requirements, but until recently they have paid too little attention to these matters. They have generally grown their different crops on all grades of land, using the same kind of fertilizers and cultural methods. In some instances the farmers use care in selecting the land suited to a certain crop, as, for example, in the case of sugar cane, which is usually grown on the moist land of depressions and bottoms—areas admirably suited to the crop. On the other hand, striking examples of incorrect soil selection may be cited, as in the frequent use of soil having a heavy, plastic clay subsoil near the surface for peaches,

instead of land having a friable sandy clay subsoil. The question of soil adaptations will be brought out more specifically under the soil-type descriptions.

COTTON.

This crop gives the best average results on the sandy loams and fine sandy loams of the uplands and second bottoms. In dry years the first-bottom soils give the largest yields and most profitable returns by reason of the little fertilization required on these productive lands. The average profit of cotton culture on bottom lands is materially diminished by overflows, wet seasons, and the abundance of very poorly drained spots little suited to cotton even in years of normal seasonal conditions.

The experience of a number of farmers indicates the desirability of selecting varieties of cotton suited to the different types of soil. For example, the King, which is an early maturing variety, has been found, in some instances at least, to give more satisfactory results on late clay and silt loam soils than some of the slower maturing varieties, such as Cook, which do particularly well on the earlier, warmer-natured sandy loams. It would scarcely be expected that a variety bred on droughty upland soil like the Norfolk sand would give as good results on the wet bottom lands as varieties accustomed to such conditions. Some varieties are inclined to grow largely to weed on wet lands, while others fruit lightly on deep sandy lands capable of holding little moisture. This is a matter to which farmers could well afford to pay more attention.

Cotton is largely grown on beds from $2\frac{1}{2}$ to $3\frac{1}{2}$ feet apart and standing 5 to 8 inches above the bottom of the intervening "middle." These beds are usually prepared by rebedding the old "middles." The crop is sometimes planted on narrow ridges listed up with two furrows, the remainder of the old bed being plowed out afterwards. Much better average results would be had from broadcast fall breaking to a depth of 6 to 10 inches, except in case of the deep sandy soils, which need no loosening. Where there is refuse vegetable matter or any considerable covering of vegetation all land should be fall plowed, so as to allow sufficient time for the incorporated material to decompose before spring planting.

The usual cultivation of the crop consists of first "barring off" or "siding" with a turning plow or light shovel, then chopping, and later running around and plowing out of the middles several times with sweeps and scrapes. From two to three hoeings are usually required to remove the grass from between the stalks. Side harrowing should be more extensively practiced.

In some sections the sandy lands particularly are affected in local areas with cotton wilt.[1] The best remedy for such diseased areas is

[1] See Farmers' Bulletins Nos. 302 and 333 and Miss. Agr. Exp. Sta. Bulletin No. 140.

to plant them to crops other than cotton, such as oats, potatoes, and velvet beans. Deep fall plowing is considered effective in destroying the fungus producing wilt.

CORN.

Although this is an important crop, the acreage devoted to it on the average farm is too small as compared with that given over to cotton. With better cultivation and fertilization the average yields could easily be doubled.

Corn is planted both on ridges and in the water furrow. According to the latter method it is planted in gutterlike furrows between high ridges and cultivated somewhat after the Williamson plan.[1] This water-furrow method is suited to sandy loam soils having sandy clay subsoils, and not to those having a stiff clay near the surface, like the Susquehanna fine sandy loam, for the reason that such clay on exposure is likely to bake, making it difficult to restore the proper condition of tilth in time to insure good root development. But with soils such as the Orangeburg, Ruston, Cahaba, and Kalmia fine sandy loams and the Orangeburg sandy loam the water-furrow method gives excellent results, owing to the fact that the sandy clay subsoil is not so inclined to bake and has good underdrainage. In cultivating according to this plan, the soil of the middles is gradually turned toward the corn, so that a thoroughly pulverized bed is finally worked up, in which the plants find a deep root zone and sufficient moisture even in protracted dry seasons.

Planting on beds is advisable in case of flat areas having insufficient drainage, as is particularly true with the flat bottom-land soils like the Bibb and Ocklocknee. Some farmers have had good success on these bottom lands by planting two rows of corn on high, wide beds, or "lands."[2] The high ridge so commonly favored in the uplands causes excessive loss of moisture through the increase of surface exposed to evaporation. With thorough, deep fall breaking, which is a highly commendable practice, except in case of the deep sandy soils, corn can be cultivated to better advantage where the surface is kept more nearly level.

Cultivation should be done more generally with weeders, harrows, cultivators, and light-running shovels and scrapes, for on land thoroughly broken there will be little need for other than shallow cultivation. Too many farmers plow out the middles deeply even after the root system has spread through most of the intervening subsurface. The damage done by such ruthless destruction of the small roots and root hairs can be seen within an hour's time on a hot day in the drooping, wilted appearance of the corn blades.

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[1] See Farmers' Bulletin No. 281.

[2] This method would also work well with cotton on similar soil, insuring better drainage and probably earlier maturity.

It is encouraging that much improvement has lately taken place in corn culture throughout this section. The land is being broken deeper, shallow cultivation is becoming more popular, and more attention is being given to the problem of fertilization and rotation with the legumes.[1]

Fertilizers are decidedly profitable with corn grown on the upland soils and probably to a less degree on the second-bottom land. A mixture of cottonseed meal and acid phosphate in the proportion of about 2 to 1 gives good results. An acreage application of 500 pounds of such a mixture has been found to give excellent results on most of the upland soils. The amount necessary varies with the character and condition of the soil. The Orangeburg and Cahaba soils, as a rule, do not need as much as the corresponding types of the Ruston and Susquehanna series. Those types having a clay subsoil near the surface do not need as heavy an application as the deep sandy lands. Again, soils rich in humus do not require so much as the droughty lands impoverished through severe usage. Some kainit is needed on the sandier types. Nitrate of soda applied about the time of laying-by, or before, if the plants show signs of lagging, in many cases can be used profitably. An acreage application of 75 to 150 pounds of sodium nitrate is usually sufficient. The corn crop is not always fertilized and the applications average lighter than those made for cotton.

The corn prize contests recently inaugurated are accomplishing a great good in improving the yields of this crop.[2] It is believed that the near future will show a sharp advance in the yields of corn in Lauderdale and surrounding counties.

The following varieties of corn are most commonly grown: Mosby's Prolific, Georgia Red Cob, Petty, Hasting's Prolific, Marlboro, and Mexican June.

OATS.

It can not be said that anything like the same tendency toward improvement is being shown in the culture of oats as with corn. In the first place oats are considered of much less importance, and, secondly, many farmers and local stock owners have figured that they can be shipped in cheaper than they can be grown.

There is an abundance of land well suited to the crop, such as the heavier types of the Orangeburg, Ruston, Norfolk, Cahaba, Kalmia, and Susquehanna series, and the better drained first-bottom soils.

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[1] See Farmers' Bulletin No. 414, Corn Cultivation.

[2] The records of 14 participants of Lauderdale and adjoining counties in corn contests during the summer of 1910, as examined at the Meridian Board of Trade, showed yields ranging from 46 to 136 bushels per acre, at a cost of $9.25 to $34.50. In one case a yield of 153¾ bushels per acre was reported, but the cost was not ascertained. In still another instance a yield of 126 bushels was secured on 1 acre at a cost of $55.

These, if properly handled, will produce oats in a sufficiently profitable way to warrant greater attention to the crop, especially since it fits so well into a number of rotations which sooner or later must be practiced if the agriculture of the county is to keep pace with other similar regions.

It need not be expected that good yields of oats or any other crop can be secured by seeding on roughly broken land containing little humus. Oats should be sown in the fall on thoroughly prepared land containing enough organic matter to prevent excessive baking or compacting during dry spells. The soil should be thoroughly broken to a depth of at least 6 inches and harrowed repeatedly to pulverize clods that would interfere with the growth of the young plants. Spring-sown oats often fail to get high enough to cut. The crop does especially well after velvet beans and cowpeas. An application of 300 to 500 pounds of cottonseed meal and acid phosphate mixed in the proportion of 2 to 1 will prove decidedly beneficial.

The crop can be used to advantage as a winter cover crop. It fits well into good rotations with cotton and corn, and when carefully handled gives good yields of excellent feed. Oats are usually sown broadcast, but as good and sometimes better yields are secured when the crop is grown in rows about 18 to 24 inches apart and given occasional shallow cultivation and side applications of sodium nitrate at the rate of about 75 to 150 pounds per acre.[1]

RYE.

Rye does well on soils similar to and even sandier than those suited to oats, being particularly adapted to the well-drained sandy loams and fine sandy loams. On the fine sands it yields very well. As a winter cover crop and for late winter and spring grazing rye is very valuable. It also can be used to advantage for supplying humus, especially when plowed under green preceding Irish potatoes, corn, cotton, and a number of vegetables.

SUGAR CANE.

In view of the fact that Lauderdale County includes a large area of land well suited to sugar cane, with a ready market for the sirup at good prices, this crop deserves to be grown more extensively. At present many farmers grow small patches for the production of table sirup on moist creek-bottom and branch lands and in the upland depressions. Some occasionally market the product, but as yet there has been no considerable effort to establish the industry of sugar cane sirup production upon an important basis.

[1] For a further discussion of the oat crop see Farmers' Bulletin No. 436, Winter Oats for the South.

The Ocklocknee and even the Bibb soils of the first bottoms, the Kalmia of the second bottoms, and the upland depressions and lower slopes give heavy yields of sugar cane with comparatively light fertilization. With thorough soil preparation and liberal fertilization with high-grade mixtures, the well-drained second bottoms and upland sandy loams and fine sandy loams, particularly of the Ruston, Cahaba, and Norfolk series, give good yields of sirup of fine color and delightful flavor. The product from the Orangeburg soils, especially where the red sandy clay subsoil comes near the surface, and that from land strongly enriched by stock or heavy applications of fresh barnyard manure, is inferior in color and flavor. Nevertheless, compost and barnyard manure in moderate quantities is a beneficial application for the crop.[1]

SORGHUM.

Sorghum is also grown in patches for table sirup. It thrives on the soils suited to sugar cane, as well as on the Orangeburg and Susquehanna fine sandy loams and the Orangeburg sandy loam. Barnyard manure and mixtures of cottonseed meal and acid phosphate in moderate quantities constitute good manurial applications. The cultivation necessary is quite similar to that required for corn. It should be planted on well-prepared land, hoed, and plowed several times with shallow running cultivators or shovels. In addition to its value for table sirup, sorghum is a good forage crop for stock, including hogs, when properly fed. Heavy feeds of the green plant should never be given at first, but by light feeding in the beginning stock can soon be trained to take moderate quantities without danger.[2]

PEANUTS.

Peanuts[3] should be grown very much more extensively, especially for hog forage. The crop does well on the Orangeburg, Ruston, Cahaba, and Kalmia fine sandy loams, the Orangeburg sandy loam, and the Ruston, Cahaba, and Kalmia silt loams, and fairly well on the Susquehanna fine sandy loam. Hogs pastured on peanuts make rapid growth, especially with occasional feeds of corn. For market the animals should be finished up on corn. In rooting for the nuts the soil is worked up into a good condition of tilth, frequently equal

[1] For further discussion of fertilization and cultivation of sugar cane see Soil Survey reports of Thomas and Grady Counties, Ga., by Hugh H. Bennett.

[2] "Sorghum may be fed to all kinds of stock, even to poultry, with very profitable results. A full feed should not be given at first, particularly if the animals are hungry. It is a good practice to give first a little feed of grain or other food and then a small quantity of sorghum. The latter may be increased day by day until a full ration is reached. Fresh sorghum is very succulent forage, and, like clover, is liable to cause bloating when fed in too large quantities at first. With ordinary precautions no trouble from this source need be feared." (See Farmers' Bulletins 246 and 288.)

[3] See Farmers' Bulletin No. 431, The Peanut.

to that secured only by deep breaking and repeated harrowing. In wet weather, when the soil is in a soggy condition, particularly where there is a clay subsoil within 4 to 6 inches of the surface, unfavorable structural conditions are likely to ensue where hogs or other stock are kept on the land.

Peanuts can be grown in rows by themselves or between corn rows. The cultivation necessary is about the same as that required for corn, and when grown between corn very little extra cultivation is needed. The crop belongs to the legume family, and it improves the land both by storing nitrogen and by supplying vegetable matter. The tops make an excellent hay.

Light-textured soils, not extremely rich in organic matter, give best results. High-grade commercial fertilizer in applications of about 200 to 800 pounds per acre is very beneficial. Good mixtures can be prepared at home with cottonseed meal, acid phosphate, and kainit. Lime is helpful in assisting the filling of the pods. An acreage application of about 1,000 pounds of burnt lime would probably be sufficient for the good peanut soils of Lauderdale County, except in the case of the Susquehanna and Kalmia fine sandy loams, which would likely need a ton per acre.[1]

POTATOES.

There are good opportunities for the production of sweet potatoes for shipment and for hog feed (as a field forage crop). Practically all farmers grow enough sweet potatoes for home use and considerable sales are made on the Meridian market. Several varieties of sweet potatoes give excellent results on the lighter soils, such as the Norfolk, Ruston, Kalmia, Orangeburg, and Cahaba fine sandy loams, the Orangeburg sandy loam, and the fine sands of the Susquehanna and Orangeburg series. These soils should be supplied with moderate amounts of vegetable matter, such as cowpeas, oat stubble, coarse barnyard manure, or other vegetation suited to opening up the soil in a way to effect good aeration. Applications of 500 to 1,000 pounds per acre of a mixture of cottonseed meal, acid phosphate, and potash salts analyzing about 8–2–8, mixed with the soil and listed on about three weeks before planting, have proved very satisfactory.[2] For an early market crop the plants should be set in the field about the last of March.

Early Irish potatoes thrive on the sandy loams and fine sandy loams of the Norfolk, Orangeburg, Cahaba, and Ruston series. For a late crop the silt loams and very fine sandy loams give best results. Since yields of 100 to 200 bushels per acre are easily secured, this crop should be more extensively grown for marketing. Barnyard

[1] For further information see Farmers' Bulletin No. 431.

[2] See Soil Survey Report of Thomas County, Ga., and Farmers' Bulletin No. 324.

manure or cottonseed meal used in conjunction with 300 to 500 pounds per acre of a mixture of acid phosphate and potash salts have proved good manurial applications.[1]

MELONS.

The well-drained sandy loams and fine sandy loams are adapted to watermelons and cantaloupes. With liberal fertilization watermelons do well on the sandy and fine sand types.

Watermelons do best on land broken broadcast to a depth of 5 to 8 inches, some time before the crop is planted. The hills should be spaced 10 to 12 feet apart each way. In the Soil Survey Report of Thomas County, Ga., where many carloads of melons are grown for shipment on soils somewhat similar to those of Lauderdale County, it is stated that—

> The most effective fertilizer is stable or barnyard manure or cottonseed manure compost, used at the acreage rate of about 5 to 10 tons, according to the condition of the soil, in conjunction with 500 or 600 pounds of a fertilizer analyzing something like 10–3–4. There is a difference of opinion among growers as to whether manure should be applied in the drill or concentrated about the hills. In view of the fact that the watermelon feeds over a considerable space and, under the prevailing practice of spacing (10 by 12 feet), is quite able to reach the fertilizer between the hills, broadcasting with heavy applications of fertilizing materials is recommended.

A very good field of melons was seen on the Susquehanna fine sandy loam, where 1½ tons of barnyard manure and 300 pounds of acid phosphate had been applied to the acre. The Georgia Rattlesnake, Bancroft, and Kolb Gem are common varieties.

Cantaloupes succeed on the sandy loams and fine sandy loams of the Orangeburg, Ruston, and Cahaba soils, particularly. For this crop the seed bed should be thoroughly prepared to a depth of at least 10 inches and fertilized with 500 to 1,000 pounds per acre of a high-grade mixture analyzing 8–3–8 to 10–4–10.[2]

VEGETABLES.

The sandy soils, ranging from coarse sand to fine sandy loam, are well suited to a large number of early to medium vegetables, while the heavier types, including the fine sandy loams, very fine sandy loams, and silt loams, give good results with medium to late vegetables. The sandy loam, fine sandy loam, sand, and fine sand of the Orangeburg, the fine sandy loams and sands of the Ruston and Norfolk, and the fine sandy loam of the Cahaba series, are the best all round vegetable lands, while the silt loams give best results with truck crops such as cauliflower, spinach, beets, late cabbage, and col-

[1] For further discussion of Irish potato culture see Farmers' Bulletin No. 407.
[2] See Soil Survey Report of Thomas County, Ga., and Farmers' Bulletin No. 324.

lards. The adaptation of individual soils to vegetables is more specifically brought out in the subsequent type descriptions.

Beets, eggplants, snap beans, lima beans, field peas, garden peas, turnips, mustard, okra, squash, cucumbers, tomatoes, radishes, lettuce, peppers, parsley, cauliflower, and other vegetables can be successfully grown. A number of these are grown for local markets on the Cahaba soils in the vicinity of Meridian and on the Orangeburg soils to the south of this city. There are good opportunities for the development of a more extensive trucking industry, especially in the production of early vegetables for shipment.

For the truck crops the soil, except in the case of the deep sandy types, should be thoroughly broken to a depth of 6 to 8 or 10 inches and well pulverized by harrowing. The land should be kept well supplied with organic matter by growing and occasionally plowing under legumes and rye or oats and by liberal addition of barnyard manure. Also moderate to heavy applications of fertilizers of the better grades are necessary. Mixtures of cottonseed meal, acid phosphate, sulphate of potash, or kainit will meet the requirements of most vegetables. Mixtures analyzing from about 8–4–4 to 10–6–8 should prove satisfactory.

FRUITS.

Peaches, plums, pears, blackberries, dewberries, and figs do particularly well on the sandy loam and fine sandy loam of the Orangeburg and Ruston series. Elberta peaches of fine flavor and color are being successfully grown for shipment on the Orangeburg soils to the south of Meridian. The Orangeburg soils have been largely and profitably used for peaches throughout the Atlantic and Gulf Coastal Plains, and there is no question that they constitute the best peach soils of the South. In addition to the Elberta, a number of other good varieties are grown for home use and local markets.

Plums can be successfully grown, although little attention has been given the crop. Wild plums, blackberries, and dewberries thrive on all the well-drained uplands, but the Orangeburg, Ruston, and Cahaba fine sandy loams and the Orangeburg sandy loam would be best for the cultivation of these fruits.

Figs also do well with little attention on the upland soils in which drainage has been properly established, growing luxuriantly in the corners of gardens and fields and about yards. A small variety of good flavor and poor keeping quality is the kind grown. This is used at home and marketed in a small way at Meridian. The fig makes a splendid preserve and should be more largely used for this purpose.

Pecans do well on the sandy loam and fine sandy loam, particularly of the uplands and second bottoms. Only a few trees have been set, but these are doing well.

Strawberries can be successfully grown on the Orangeburg, Ruston, and Cahaba soils having a texture heavier than fine sand. Several varieties of summer apples and a few cherries are grown for home use.

Although little damage has been occasioned by insects or disease, fruit growers should acquaint themselves with the modern methods for controlling the enemies of fruit trees by spraying.[1]

COWPEAS, VELVET BEANS, AND OTHER LEGUMES.

The great value of the leguminous crops as soil improvers and for pasture and hay is well understood by most farmers, and they are being grown more and more. These crops thrive on most of the soils of the county topographically suited to agriculture and are easy to produce. They fit well into the best rotations that can be practiced.

For the legumes the land should be well prepared, although many farmers have failed to recognize the importance of this matter. The soil should be broken to a depth of 6 to 10 inches and thoroughly harrowed. Moderate applications of barnyard manure or commercial fertilizer, or both, should be made on hard-used, impoverished soils. Land rich in organic matter requires little fertilization in order to produce good yields of these crops.

Cowpeas[2] give excellent results sown broadcast, in rows by themselves or between corn. Velvet beans[3] and soy beans[4] should be planted in rows somewhat as corn. Bur clover is a fine winter cover crop and does well on the sandy loams and heavier types. Lespedeza[5] grows wild throughout the area. It does best on the bottom-land soils, growing luxuriantly on the Bibb and Ocklocknee types. A number of wild legumes, such as the vetches, afford good grazing even on the timbered, deep, sandy uplands. All of these crops can be cut for hay except the wild legumes, which grow scatteringly. They are very nutritious and, in addition to constituting the best soil-improving plants, are crops that can be counted upon as a substantial support in stock raising, including hogs, cattle, and mules.

GRASSES.

A number of wild grasses afford excellent grazing throughout the area. Carpet grass (*Paspalum compressum*) thrives on the bottom lands, particularly on the Bibb and Ocklocknee soils, and also does well on the heavier uplands, including the Susquehanna clay. It affords good grazing and is a satisfactory lawn grass. Water grass

[1] See Farmers' Bulletin No. 243, "Fungicides and their Use in preventing Diseases of Fruit."

[2] See Farmers' Bulletin No. 318.

[3] See Bulletin No. 102, Florida Expt. Sta.

[4] See Farmers' Bulletin No. 372.

[5] See Farmers' Bulletin No. 441.

(*Paspalum dilatatum*) attains a rank growth in all moist places. This is a good pasture grass and makes fair hay if cut before the tall woody stems have developed. A number of other water-loving grasses furnish good grazing throughout the summer.

Broom sedge does well on practically all the soils of the county, except the frequently overflowed bottom lands, and supplies the chief summer grazing of a large proportion of the stock raised. Much land is burned off every year in order to facilitate early grazing of broom sedge. Fair hay is secured by cutting before a too woody texture is developed in the stems, but this grass is seldom cut for this purpose.

Bermuda is probably the most valuable grass suited to the area. It thrives on practically every soil of the county. Besides being a valuable grazing, hay, and lawn grass, Bermuda grass is of considerable value in that it is an excellent soil binder, suited to protecting areas which, on account of their steep slope, are subject to ruinous erosion. It spreads rapidly and forms a turf that is very effective in holding the land against erosion. Most of the gullied and washed areas of the county should be devoted either to forestry or Bermuda pasturage. There are large unused areas of bottom and second-bottom soils that could be profitably used for the production of Bermuda hay, which is a nutritious, valuable feed.[1] It is difficult to eradicate Bermuda grass when started, but it can be killed by sowing the land to thick-growing, shade-producing crops, like cowpeas.

Crab grass is another plant that has a wide soil adaptation. It grows on all well-drained soils in such a way as to make it one of the most troublesome grasses to cultivated crops. It is not so nutritious as Bermuda, but a much better hay crop than broom sedge. Heavy yields are secured after watermelons and vegetables, or on any land that has been fertilized and left uncultivated in the summer.

FLOWERS.

Canna and dahlia bulbs are being grown commercially in a small way. The success secured indicates that the industry can be profitably extended. Best results with bulb culture are likely to be had on the Cahaba, Ruston, and Orangeburg fine sandy loams and the Orangeburg sandy loam having a clay subsoil within 5 to 8 or 10 inches of the surface. In order to produce bulbs not too bulky for shipment, the plants should be grown closely together on soils not too liberally supplied with nitrogenous manures.

A great variety of wild and domestic flowers grow on almost all the soils. In many yards roses bloom throughout the year. Althea, crape myrtle, and cape jessamine are almost universal yard ornamentals of this section.

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[1] For further discussion of the management and value of Bermuda grass see Circular No. 31, Div. of Agrostology, Bur. of Plant Ind., and Bulletin No. 90, Oklahoma Expt. Sta.

STOCK RAISING.

It has already been pointed out that the splendid adaptation of a large acreage of land to nutritious forage crops and grasses, peanuts, sweet potatoes, corn, oats, and rye offer attractive opportunities for raising more hogs, cattle, mules, and horses. Already better breeds of hogs and cattle are supplanting the scrubby stock, but there is need for further improvement.

In view of the low cost at which hogs can be raised, there is no question of the profit in producing these animals for shipment where earnest effort is put into the business.[1]

The tick has been something of a menace to cattle raising, but this problem is likely soon to be controlled through the widespread tick-eradication movement.[2] More stock should be grown for home use and for market.[3] Many farmers have plenty of good milk and butter, but there are many who need more of these home supplies. Most of the draft work is done by mules. These could be profitably raised at home to a much greater extent.

In the past cattle and hogs have been too generally left to secure their own living through a large part of the year in the fields and woods. While no important stock industry can be established upon this plan of feeding, unquestionably a very considerable part of the summer feeding can be secured from pasturage, especially in the case of cattle. During the winter and spring, however, stock should be fed, notwithstanding considerable assistance can be had from grazing even during these seasons. There is no need of depending solely upon pasturage when so many forage crops can be easily grown.

ROTATION OF CROPS.

Under the system in which cotton and corn have been the important crops too little attention has been paid to rotation. One of the most serious drawbacks to the cultivation of so large an acreage of these clean-cultivated crops is that the organic-matter content of the soil is in time reduced to a point where the sandy lands become loose and incoherent and very irretentive of moisture, while the heavier soils compact and crust, resulting in increased susceptibility to drought.

The necessity of growing more leguminous crops in rotation with the staples, both for the purpose of supplying humus and adding nitrogen, has already been pointed out. Cowpeas, velvet beans, soy beans, bur clover, and vetch should be included in rotations with cotton, corn, oats, rye, vegetables, and melons to a much greater

[1] See Farmers' Bulletin No. 411.
[2] See Circulars Nos. 97, 110, 258, and 378, Bureau of Animal Industry.
[3] See Bulletins Nos. 150, 151, and 154, Ala. Agr. Expt. Sta.

extent. It is encouraging that cowpeas, particularly, are coming more and more into use as a forage and hay crop and soil improver. With the advantage of summer and winter crops, it is possible to arrange varied schemes of crop succession by which the land can be occupied throughout the year. A good rotation, to illustrate this point, is to follow cotton with rye, oats, or bur clover, then plant corn, with cowpeas sown between the rows, then rape, bur clover, or vetch as second winter crops, to be followed by cotton.

PLOWING.

The depth of breaking land should on most soils be increased from the prevailing average of from 2 to 4 inches to at least 8 or 10 inches. It was noticed in many fields that constant plowing at a uniform shallow depth had resulted in the formation of a compact, hardpan-like subsurface unfavorable to the proper circulation of soil moisture and atmosphere and resistant to root development.

In the breaking of land light one-horse plows generally should be supplanted by two-horse, heavy, deep-running plows or disks. Also, the land should generally be broken in the fall. This would not, of course, apply to the deep sandy soils, which already are too loose in structure, except to turn under vegetable matter. The prevailing practice of shallow cultivation would prove more efficacious on deeper broken land. More harrows, weeders, and cultivators should be used.

FERTILIZERS.

Commercial fertilizers have been used on a gradually increasing scale since their introduction, and it is likely the increase will continue.[1] Already many farmers have learned that heavier applications of the better grades of fertilizers are more profitable. This fact has been convincingly emphasized in the prize corn contests recently inaugurated.

A large part of the commercial fertilizers used is applied to cotton. Corn until recently has been sparingly fertilized, while manurial applications have rarely been used for oats or other crops, except in a small way for melons, potatoes, and sugar cane. Ready-mixed brands analyzing about 10–1.65–2 have been most commonly used, and the prevailing acreage applications have ranged from about 200 to 300 pounds for cotton and 100 to 200 pounds for corn. It is safe to say that such light applications of such low-grade mixtures can not be very profitable.

Some farmers are beginning to mix their own fertilizers. This is a very commendable practice, as the farmer in this way is brought to

[1] According to the census, $46,230 was expended for fertilizers in 1899.

look more into the particular needs of particular crops grown on varied soils under different seasonal conditions and cultural treatment. Cottonseed meal, dried blood, acid phosphate, potash salts, such as kainit and sulphate of potash, and sodium nitrate, can be easily mixed on the farm or applied separately. Sodium nitrate is becoming more popular as a late side application to corn. It is being used with much success in various parts of the South, on soils quite similar to those of Lauderdale County, for cotton, oats, and corn.

Commercial fertilizers, as a rule, prove more beneficial on soils well supplied with humus. Nitrogen, the most costly ingredient in fertilizer, is needed in relatively small amounts on soils rich in vegetable matter, especially where the legumes have been grown.

More attention is given the individual fertilizer needs of soils under the subsequent type descriptions. Owing to the fact that little experimental work has been done on the various soils represented in the county, it is not possible to offer very specific advice in regard to the fertilizer requirement of the individual soils, but a number of suggestions have been made on the basis of results secured by good farmers.

The poorly drained soils, such as the Kalmia and Bibb, and eroded areas where the raw clay subsoil has been exposed, need applications of lime. An application of about 1 ton of burnt lime per acre is very beneficial in correcting unsanitary and unfavorable structural conditions of such lands. Crop maturity would likely be hastened materially on these late soils by the addition of acid phosphate.

FARM TENURE.

According to the census, 53 per cent of the farms of Lauderdale County were operated by owners in 1899, and the average size of farms was 94 acres.[1]

The prevailing system of renting is "on shares," under which various agreements as to the division of crops and the supplying of food, stock, and implements are entered into between the renter and the landlord. Operating "on halves," the landlord usually furnishes one-half the fertilizer and all the implements and stock, and receives one-half the cotton and corn crops. Better terms are given renters owning tools and stock. Some tenants farm on a cash rental basis, paying from $1 to $4 an acre, according to location and character of soil. "One-mule farms," 30 to 40 acres, are often rented for a 500-pound bale of cotton, or for about $30 to $50.

Labor conditions are prevailingly good. The daily wage ranges from 50 to 75 cents, while from $12 to $18 is paid for labor by the month. Cotton is picked at a cost of about 70 cents per 100 pounds.

[1] The census tabulates each tenancy as a farm.

SOILS.

The soils of Lauderdale County are quite varied in character of material and in point of origin. There are three well-defined soil divisions: (1) Upland, or old sedimentary soils; (2) recent stream alluvium, or first-bottom, frequently overflowed soils; and (3) old stream alluvium, or second-bottom soils, lying mainly above normal overflow.

On account of the rolling to hilly topography—the result of erosion—the upland soils are intricately associated and very patchy in occurrence, especially in the southern part of the county, where the surface configuration is, for the most part, extremely uneven. The soils of the uplands division are derived from consolidated (as the Tallahatta buhrstone) and unconsolidated (as the Lafayette) formations representing old fresh-water and possibly marine deposits.

The principal formations of the uplands are: (1) The Wilcox, which is the most extensive and includes varicolored, laminated clays, cross-bedded sands, and occasional seams of lignite or dark-colored lignitic clay; (2) the Claiborne-Tallahatta buhrstone, confined largely to the southern part of the county, which includes nearly white to mottled reddish and white soft siliceous rocks,[1] quartzite rocks, and reddish ferruginous sandstone; (3) the Lafayette, representing remnants of a later deposit which occurs throughout the area and includes reddish sands and sandy clays; and (4) the Yellow Loam, of very patchy occurrence and representing the latest upland formation.[2]

The recent stream alluvium, or first-bottom soils, occur along the several streams of the area as flat, frequently overflowed bottoms, varying from a few rods to approximately a mile in width. These are the most recently formed soils of the area; in fact, they are still in course of formation, being added to by each successive overflow, through the deposition of predominantly fine material derived from the various soils occurring in their respective drainage basins. On account of frequent overflows and the prevalence of poorly drained, permanent soggy or water-logged conditions, the soils of this division have not weathered out so thoroughly as the upland soils, or even those occurring on the second or higher bottoms, where normal processes of weathering are less retarded by poor drainage. There

[1] Small mica flakes are plainly visible; samples analyzed 75 to 80 per cent silica.

[2] The names of the geological formations used in this report are based upon the work of the Mississippi State Geological Survey. (See Bulletins Nos. 1 and 2.) Dr. E. N. Lowe, State geologist, and Dr. William N. Logan, assistant State geologist and professor of geology and mining engineering at the Mississippi Agricultural and Mechanical College, visited the area during the survey. They drove over portions of the county with the men in charge of the survey and identified the geological formations giving rise to the important soils, such as the Lafayette, Yellow Loam, Wilcox, etc. The information furnished by these gentlemen was used as a guide to the soil mapping throughout the survey, and the references in this report to the origin of the soils are based wholly on information furnished by them.

is considerable variation in the character of this recent alluvium, the result mainly of differences in degree of drainage and consequently of weathering. Texturally these soils run high in silt, clay, and fine sand, there being very little coarse sand and not a great deal of the medium-sized grains. In the wider bottoms the types are uniform over considerable areas, but along many of the smaller streams the material is so extremely heterogeneous as to preclude type differentiation. In such situations the soils have been mapped as Meadow, without attempt at type classification.

The second-bottom or stream-terrace soils consist of material deposited from overflow water before the streams had cut their channels to the present depths. These soils lie, for the most part, above normal overflow and in many places above the highest overflows recorded. The division represents an intermediate soil province between the well-drained, thoroughly weathered upland soils and the poorly drained, partially weathered first-bottom soils. There is less soil variation in this higher stream-bottom division, partly because the average good drainage condition has favored uniformity in process of weathering. In time the soils of these terraces will have weathered to such a degree that their characteristics will probably be identical with those of some of the older upland types. As a matter of fact, small areas of the best-drained Kalmia fine sandy loam are very similar to the Norfolk fine sandy loam, the distinguishing feature being the flat terrace topography and somewhat higher agricultural value of the former.

The following scheme shows the relation of the soils to the geology:

Soils from relatively old unconsolidated upland sedimentary material belonging mainly to the Wilcox formation.	Susquehanna clay. Susquehanna fine sandy loam. Susquehanna silt loam. Susquehanna fine sand.
Soils from more recent unconsolidated upland sedimentary material belonging mainly to the Lafayette formation.	Orangeburg fine sandy loam. Orangeburg sandy loam. Orangeburg fine sand. Orangeburg sand. Orangeburg coarse sand. Ruston silt loam. Ruston fine sandy loam. Ruston sand. Norfolk sand. Guin stony sandy loam.
Soils from most recent unconsolidated upland material belonging to the Yellow Loam formation.	Norfolk fine sandy loam. Norfolk silt loam.
Soil from consolidated upland sedimentary rock belonging to Claiborne-Tallahatta buhrstone formation.	Lauderdale stony clay.

First bottom soils from recent stream alluvium incompletely weathered.	Formed under good drainage conditions.	Ocklocknee sand.
	Formed under poor drainage conditions and subject to frequent overflow.	Ocklocknee clay. Ocklocknee silt loam. Ocklocknee fine sandy loam.
	Formed under very poor drainage and soggy conditions.	Bibb silt loam. Bibb fine sandy loam.
Second-bottom soils from old stream alluvium weathered to a degree intermediate between first bottom and upland soils.	Formed under good drainage conditions.	Cahaba fine sandy loam Cahaba silt loam.
	Formed under prevailing rather poor drainage conditions.	Kalmia fine sandy loam. Kalmia silt loam.
Undifferentiated first-bottom soils of variable textural and structural characteristics and profile arrangement, very poorly drained.		Meadow.

The characteristics of the individual types are brought out in the subsequent chapters. The accompanying map shows the location of the various types. In places it was difficult to establish sharp boundary lines between types, owing to imperceptible gradations between them. In other places the badly eroded condition of the land made it impossible to map every spot of soil on the scale used, necessitating the mapping of such areas according to the dominant soil. By a careful study of the various soils one using the map will not be confused by patchy occurrences of soil that could not be shown on the scale used.

The following table gives the names and extent of the various soil types of the county:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Susquehanna fine sandy loam	65,792	14.5	Ocklocknee silt loam	6,528	1.4
Ruston fine sandy loam	58,880	13.0	Norfolk sand	6,400	1.4
Ocklocknee fine sandy loam	54,656	12.1	Ruston silt loam	5,696	1.2
Orangeburg fine sandy loam	26,624	5.9	Norfolk fine sandy loam	4,672	1.0
Orangeburg sand	26,496	5.8	Bibb silt loam	4,096	.9
Susquehanna clay	25,856	5.7	Norfolk silt loam	1,728	.4
Orangeburg sandy loam	23,232	5.7	Kalmia silt loam	1,664	.4
Erosion phase	2,496		Ocklocknee sand	1,536	.3
Cahaba fine sandy loam	24,064	5.3	Orangeburg coarse sand	1,536	.3
Lauderdale stony clay	23,488	5.2	Susquehanna fine sand	1,472	.3
Bibb fine sandy loam	18,816	4.2	Ocklocknee clay	1,472	.3
Ruston sand	18,304	4.0	Cahaba silt loam	896	.2
Meadow	18,112	4.0	Susquehanna silt loam	704	.2
Orangeburg fine sand	12,032	2.7	Total	453,120	
Kalmia fine sandy loam	7,936	1.8			
Guin stony sandy loam	7,936	1.8			

ORANGEBURG COARSE SAND.

The soil of the Orangeburg coarse sand consists of a grayish to yellowish-brown, loose, coarse sand, which at a depth of about 8 to 20 inches usually becomes reddish in color. Red, sticky sand, or light, coarse sandy loam, is usually encountered at from 20 to 30 inches, although the coarse sand of the soil may continue to a depth of 3 feet or more. It is derived from the Lafayette formation.

The type occupies the crests of ridges and hills. It gives way to the Orangeburg sand or other types on the lower slopes, rarely extending to stream bottoms. It is developed in several scattered areas in the southern part of the county, the total area being rather limited.

Longleaf pine and a thick undergrowth of scrub oak make up the principal timber growth. On account of the loose, open nature of this coarse material, rain water rapidly passes downward through the soil, while the content of soil moisture is kept at a point much below the demands of ordinary farm crops on account of the thorough aeration and drainage. The type is of very low agricultural value and little of it is under cultivation, the yields of cotton and corn being very low.

Heavily fertilized with organic manures and high-grade commercial mixtures rich in potash and nitrogen, extra early vegetables and melons could be grown in a profitable way. Crops like garden peas, radishes, watermelons, Irish potatoes, and sweet potatoes would give best results. Peaches and cultivated blackberries would also do fairly well.

The Orangeburg coarse sand is valued at from $5 to $8 an acre.

ORANGEBURG SAND.

The Orangeburg sand consists of a grayish, medium to slightly loamy sand, which at a depth of something like 18 to 24 inches is underlain by a red, friable sandy clay. It occurs mainly in the southern portion of the area on the crests of ridges and hills and along slopes, often down to the line of contact with stream bottom land. It is derived from the Lafayette formation.

This soil is not quite so retentive of moisture as the Orangeburg fine sand, but it conserves moisture better than the Susquehanna soils, with which it is sometimes closely associated.

The timber growth comprises longleaf and shortleaf pine and considerable scrub oak. Vegetables, peaches, and berries find this type well suited to their requirements. Of the extensively developed types this is probably the best early vegetable soil. Sweet potatoes, melons, tomatoes, cabbage, squash, string beans, garden peas, radishes, and other vegetables could be profitably grown, especially for the early market. Dewberries, cultivated blackberries, and strawberries would also give good returns. Cotton and corn give only moderate

yields, except where the soil is liberally fertilized and well supplied with organic manures, as barnyard refuse and cowpeas, or velvet beans turned under green. High grade commercial fertilizers should be used for all crops. Those with a relatively high percentage of nitrogen and potash give best results.

ORANGEBURG FINE SAND.

The soil of the Orangeburg fine sand consists of a gray fine sand, having an average depth of 18 to 24 inches. The color of the soil changes to a pale yellow frequently at a few inches below the surface. In common with all types of similar texture, the soil is loose, friable, and capable of being cultivated under a wide range of moisture conditions. At a depth of 18 to 24 inches a red, fine sandy loam to sandy clay subsoil is encountered. This subsoil is normally friable and of a solid red color. Occasionally a slight gray mottling occurs and the material is found to be slightly plastic at a depth of about 3 feet. Where the subsoil is markedly plastic the soil has been mapped as Susquehanna fine sand.

The Orangeburg fine sand is not extensively developed, but has a general patchy distribution throughout the area, being most abundant in the northern part of the county. It extends from the crests of ridges down gentle slopes and is found in shallow drainage depressions.

The type is apparently more retentive of moisture than the Susquehanna fine sand. Crops, however, are apt to suffer in protracted droughts, especially where the soil is low in its organic-matter content.

Fair crops of cotton and corn are secured under favorable seasonal conditions. Wherever observed, watermelons and vegetables did well. Occasional thrifty-looking peach trees were noted, and it is believed that the Elberta especially could be profitably grown on the type. By growing cowpeas, velvet beans, and vetch the soil could be made much more productive, especially by plowing under an occasional crop. Commercial fertilizers high in potash and nitrogen are needed in order to secure anything like good yields. Corn, oats, cotton, and forage crops, early vegetables, and peaches are the most promising crops.

At present the type is valuable mainly as timber land and sells at from $5 to $10 an acre.

ORANGEBURG FINE SANDY LOAM.

The soil of the Orangeburg fine sandy loam consists of a gray to grayish-brown or slightly reddish brown fine sandy loam having a depth of about 6 to 15 inches. This is underlain by a bright red sandy clay, which is uniformly friable to a depth of 36 inches. In occasional areas affected by seepage water the subsoil may be sparingly mottled with gray or yellow in its lower depths.

This type occurs principally in the northern and southern parts of Lauderdale County, and especially near Stinson, where typical bodies are developed. It is derived from the Lafayette formation, and, save for its finer texture, is quite similar to the coarser members of the series. The topography is much less broken, being undulating and gently rolling and broken only in places.

Because of its finer texture, it is much more retentive of moisture than the coarser members of the Orangeburg series. Fertilizers have a more lasting effect upon it. It can not be plowed under as wide a range of moisture conditions as the sandy loam, because of its greater tendency to compact with dry weather following wet plowing.

The type is considered a very good general purpose soil. It is very well adapted to vegetables, pecans, plums, pears, figs, cotton, corn, oats, cowpeas, velvet beans, and a number of other forage crops. Irish and sweet potatoes, cabbage, squash, tomatoes, and a number of vegetables do well on the type.

Under the prevailing system of farm management, including usually moderate applications of the ordinary grades of fertilizer, cotton averages one-half bale and corn 15 to 20 bushels to the acre. By growing the legumes in rotation with other crops and using better fertilizers the yields of these and other crops can be increased considerably. To the south of Meridian are located several commercial peach orchards, from which several carloads are shipped each year. The Elberta is most extensively grown. Large, firm-fleshed, highly colored, and well-flavored peaches are grown with but little trouble. Only a small proportion of the Orangeburg fine sandy loam is used for peaches. Much of the type occurs on high elevations and situations quite favorable to peach production. The trees begin bearing at three years and are in full bearing from five to seven years.

Winter oats should be given a more important place. The crop should be seeded in the fall on thoroughly harrowed land, and fertilized with something like 250 to 300 pounds per acre of a brand analyzing close to 8–3–3. Some sodium nitrate, 50 to 100 pounds per acre, could be profitably used later on in case the plants show signs of lagging.

For cotton 400 to 500 pounds per acre of an 8–3–3 mixture should give a yield of at least 1 bale to the acre, provided thorough tillage is given the crop, especially where cowpeas, velvet beans, bur clover, or vetch have been grown at occasional intervals. From 300 to 400 pounds per acre of the same mixture under the same treatment—that is, good cultivation and leguminous crop rotations, has helped bring the yield up to 50 or more bushels of corn per acre on this soil in many instances, particularly where a later side application of 75 to 100 pounds of sodium nitrate has been made.

Undeveloped areas of this soil sell for $10 to $25 an acre, while areas well improved easily bring twice that figure.

ORANGEBURG SANDY LOAM.

The soil of the Orangeburg sandy loam to a depth of about 8 to 15 inches consists of a gray to grayish-brown sandy loam. The lower subsoil, as well as the immediate surface soil of occasional areas, is a brownish or slightly reddish brown heavy sandy loam. The subsoil is a mealy, friable sandy clay of uniform red color, contrasting strikingly in its structural characteristics with the stiff, plastic, somewhat similarly colored subsoil of the Susquehanna. Reddish-brown, iron-cemented sandstone is frequently encountered on the higher ridges and eroded slopes, especially where the subsoil is somewhat similar to that of the Susquehanna. The depth of the sandy mantle generally increases with descent of slope, and often the type grades into the Orangeburg sand, which could not in all cases be mapped separately, owing to the small size and inaccessible location of the areas. There have been included with the Orangeburg sandy loam galled spots, or small areas, in which the clay subsoil has been exposed or brought very near the surface through the agency of erosion.

This type is most extensively developed in the southern part of the county, where it occupies the crests of narrow, winding ridges, with steep, sudden slopes, the gentler slopes of stream valleys, and gently rolling to broken uplands. Scattered areas occur throughout the county, except in the northwestern part, where it is practically wanting.

The type in many places passes suddenly into the Guin stony sandy loam and into the Lauderdale stony clay along or near the brink of slopes, especially those of the narrow, winding ridges in the southern and central-western part of the county.

This soil has good surface and under drainage and yet conserves moisture in amounts usually adequate for the needs of crops adapted to the type throughout protracted droughts, provided it is managed in anything like the proper way. Unfortunately, the type is peculiarly susceptible to ruinous erosion under the conditions of rolling topography obtaining in the area, particularly the southwestern third of the county. If the gentler slopes are not terraced and the steep situations kept in timber, deep gorgelike gullies or "caves" gradually encroach upon cultivated fields, eventually bringing about a topographic condition too broken for other than patchy cultivation. In the steeper situations these gullies have eaten out canyonlike hollows, even through timbered areas, until the Orangeburg sandy loam occurs in many places as narrow, tonguelike ridges reaching out from the higher elevations in all directions. Bridges placed over the

heads of these deep gullies are of very common occurrence along the ridge roads. Frequently the gullies, advancing from opposite directions, have completely cut across high ridges, necessitating the construction of bridges. The gullies often have perpendicular walls, sometimes 25 to 50 feet or more in height.

With each heavy rain great masses of soil cave into the gullies from their heads in perpendicular chunks sometimes 10 or 15 feet thick. Lateral encroachment is comparatively slow, the most disastrous work following along the natural drainage-way depression. To check this ruinous erosion slopes must be terraced, seeded to Bermuda grass, and even planted to trees or rapidly growing and fast-holding plants like honeysuckle. The best way of handling erosion in the case of the Orangeburg soils is to begin, before deep gullies have been cut, to terrace and incorporate vegetable matter. In many of the gullies the advancement can be checked by cutting down the sides so as to get a slope on which to start Bermuda grass, lespedeza, honeysuckle, or willows, which are good soil binders.

The more broken areas are shown by cross lining. These have been so badly eroded as to make them of little agricultural value except for forestry, Bermuda pasturage, and fruit culture in patches.

The Orangeburg sandy loam is derived from the Lafayette formation, laid down over a badly eroded surface, which accounts for the occurrence of areas of the type from near the foot of the deeper stream valleys to the crests of the higher ridges and also for its unconformable occurrence directly over both the older Tallahatta buhrstone and the still older Wilcox formations.

The native timber growth consists mainly of oak, hickory, dogwood, and shortleaf and longleaf pine. Lespedeza and other valuable wild grazing grasses are of common occurrence, but scarcely of such abundance as on the heavier types.

This soil is preeminently the most productive of the upland series, except, perhaps, the closely related Orangeburg fine sandy loam. It is suited, where the topography is favorable, to the profitable production of a wider range of crops than any other type in the county. With good treatment a bale of cotton and from 40 to 50 bushels of corn per acre can easily be secured, while with fertilization with mixtures of cottonseed meal and acid phosphate better yields can be made. Cowpeas, peanuts, oats, and a number of other crops also give good results.

There is probably no better peach soil in the United States; in fact, this is the same soil as that which has been so successfully used for peaches in the famous peach-growing section of Fort Valley, Ga. The Elberta has been given most attention. On this soil it is of a good, firm quality, delightfully flavored and highly colored.

A great variety of vegetables, including cabbage, squash, sweet and Irish potatoes, watermelons, cucumbers, asparagus, and tomatoes, give heavy yields, come to maturity quickly, and are of favorable quality. Small fruits, such as blackberries, dewberries, and strawberries, also can be successfully grown. Pecans, plums, and figs give good results.

The smoother areas are admirably adapted to the production of cotton, corn, peanuts, oats, cowpeas (for hay and peas), velvet beans, vetch, bur clover, melons, and vegetables. The ordinary yields can easily be doubled by more intensive treatment, especially the more extensive growing of such legumes as cowpeas, velvet beans, and vetch in rotation with crops like cotton, corn, oats, and peanuts.

Rather low grades of commercial fertilizers are being used in small applications. Mixtures of cottonseed meal, kainit, and acid phosphate can easily be prepared by the farmers to suit the needs of the several crops, especially where accurate check is kept upon the results secured as a guide for future use. Mixtures analyzing something like 8–3–3 give good results with the ordinary crops, cotton, corn, and oats. An acreage application of about 500 pounds for cotton, 300 to 400 pounds for corn, and 200 to 300 pounds for oats and peanuts, it is believed, will help greatly toward advancing the average yields, especially where the legumes are grown and the soil kept well supplied with organic matter such as can be added through applications of barnyard manure or the turning under of cowpeas, vetch, or rye. Vegetables and melons should be given heavier applications of better grades, such as 8–3–4 and 8–4–5 mixtures.

The best areas of the Orangeburg sandy loam sell for $25 to $35 an acre. Some of the most severely washed areas are valued principally for grazing and forestry.

SUSQUEHANNA CLAY.

The Susquehanna clay, where it occurs typically, consists of a reddish-brown, heavy, fine sandy loam to clay, which at an average depth of 3 to 4 inches is underlain by a stiff, plastic heavy red clay, usually more or less mottled with gray and yellow.

In many eroded portions the sandy mantle has entirely disappeared, leaving the heavy clay subsoil exposed. Even in places where the sandy covering occurs the clay comes so near the surface that plowing is usually difficult, owing to the unwieldy character of this latter soil. Some patches of Susquehanna fine sandy loam have been included with this type, owing to their small size.

This soil is derived largely from the lignitic clays of the Wilcox formation. It occurs mainly to the east of Alamucha Creek, near the Alabama line, and sparingly elsewhere, being most common on rather

steep, eroded slopes, and sometimes appearing as isolated knobs of limited extent. Some areas have suffered severely from erosion, being so cut up with gullies as to be useless except for pasturage.

The type has good surface drainage, but owing to its impermeable nature it absorbs little water, a fact which aids excessive erosion and causes crops to suffer during drought. It endures excessive rainfall better than drought, but crops are apt to suffer in protracted wet spells.

The Susquehanna clay is a difficult soil to till, requiring heavy draught for even shallow breaking. Cultivation is limited to a narrow range of moisture conditions. When too wet it is impossible to plow without causing puddling of an extremely objectionable nature. The type has a narrow range of crop adaptation, and the steeper slopes should be reforested or seeded to Bermuda grass. It is best suited to forage and pasture grasses. Possibly oats and wheat would do fairly well. Satisfactory yields are impossible unless the soil is deeply broken when not too wet or too dry and liberal quantities of vegetable matter plowed under. Lime in liberal quantities (1 ton burnt lime per acre) and acid phosphate are the most needed applications aside from vegetable matter. Crop yields and land values are difficult to estimate, owing to the patchy occurrence of the type.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Susquehanna clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
24736	Soil	1.3	2.0	0.9	2.9	11.5	62.7	18.7
24737	Subsoil	.1	.6	.2	.4	1.0	62.2	35.1

SUSQUEHANNA SILT LOAM.

The Susquehanna silt loam is a grayish to grayish-brown very fine sandy loam to silt loam, having an average depth of 5 to 10 inches and changing abruptly into a subsoil of plastic red clay, mottled with drab and gray. While there is a range in the soil from very fine sandy loam to silt loam, the material is in all cases decidedly fine, the very fine sand not being so much coarser than the silt as to have any very marked effect upon the texture. The type occurs most frequently in gently rolling areas on the crests of rather broad ridges. It is found generally over the county in limited areas.

The Susquehanna silt loam in its natural condition is a less desirable soil for crops like cotton and corn than the fine sandy loam, especially in wet years. This is due to the tendency of the soil to

remain soggy in wet seasons. On the other hand, the soil assumes a compact structural condition in dry seasons, unless it is liberally supplied with organic matter. Fall plowing and frequent incorporation of vegetable matter, such as cowpeas and barnyard manure, would prove very beneficial by opening up the soil to better aeration and by lessening the tendency to run together and harden.

The importance of keeping the soil constantly supplied with humus should never be lost sight of. A ton of burnt lime per acre would be sufficient for several years. Wheat, oats, and grasses should grow well on the type. Native wild grasses afford ample grazing, and if properly seeded profitable yields of hay could be secured. Cowpeas, bur clover, lespedeza, and Bermuda and Johnson grass would do well. Commercial fertilizers are needed for best results with corn and oats especially. An acreage application of approximately 400 pounds for corn and 300 pounds for oats of a 10–3–4 mixture probably would give good results.

Land values vary from $10 to $20 an acre.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Susquehanna silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23802	Soil	0.3	1.1	0.7	9.1	14.8	64.7	8.9
23803	Subsoil	.0	.4	.4	3.6	13.3	44.7	37.6

SUSQUEHANNA FINE SANDY LOAM.

The soil of the Susquehanna fine sandy loam to a depth of 5 to 10 inches is a gray to grayish-brown or slightly reddish brown light fine sandy loam of rather loose structure. On colluvial slopes the soil may be much deeper, while on steeper valley sides the sandy covering has in many cases been washed away, leaving bare, unproductive, red "gall spots" of the subsoil.

The change to subsoil is usually sharply marked. To a depth of about 20 inches the subsoil generally consists of fine sandy clay loam or sandy clay. Below this it is a heavy clay, very plastic, and mottled red, yellow, and gray. Because of this sticky, impervious stratum, the passage of soil waters through the subsoil is necessarily slow, and in dry seasons plants often suffer from an inadequate supply of moisture, even when the clay is quite moist to the touch.

The type is derived largely from the Wilcox formation of interstratified sands and clays, with some lignitic strata, showing striking variations in color and texture. Silicified wood, principally the trunks of trees, is occasionally seen in the exposed sections.

The extreme plasticity of the subsoil also offers considerable resistance to normal and rapid root development, so that within certain limits the deeper the surface portion of friable sandy loam the greater the agricultural value of the type. If those areas where the clay comes near the surface are plowed when too wet the soil is likely to puddle, bringing about with subsequent fair weather a compact structural condition extremely unfavorable to the preparation of a good seed bed and resistant to proper cultivation and plant development.

This is the most extensive type encountered. It occurs throughout the county, but is developed to a relatively greater extent in the northern half or two-thirds of the area. Its topography varies from gently rolling to hilly. The slopes are usually continuous, though they vary from very gentle along some of the smaller-stream valleys to steep along many of the major-stream valley walls and in the vicinity of stream heads, where there is often a peculiar amphitheaterlike depression.

The subsoil when wet is readily worked into a very sticky mass. Roadbeds in which it is exposed become very bad in wet spells. Usually the sandy surface soil is deep enough to prevent plows touching the clay, so that cultivation over the average of the type can be done easily and safely soon after rains. There are occasional washed areas along slopes where the subsoil either comes very near to the surface or actually outcrops, in which cultivation is restricted to a rather narrow range of moisture conditions. If such areas, those in which the subsoil is reached by the plow, are plowed when in a sticky condition, the soil is liable to harden with subsequent sunshiny weather in a way to bring about a compact structural condition that may prove unfavorable to plant growth for a considerable period. On the other hand, if such areas are allowed to dry out undisturbed, a hardened condition is likely to be induced, extremely resistant to proper seed-bed preparation and cultivation.

The impervious nature of the subsoil is decidedly unfavorable to good underdrainage in the more nearly level areas, and occasional depressions where surface configuration does not permit a sufficiently rapid flow off. The soil is often of a whitish cast, while the subsoil is more nearly yellow and more intensely mottled in such areas and along some of the gentler slopes bordering stream bottoms. Such areas sometimes are designated locally as "crawfish land." These could be improved for agricultural purposes by the construction of adequate ditch outlets to prevent water standing on the surface. Surface drainage is prevailingly good, and the type has good underdrainage along the slopes.

The present timber growth consists largely of pine, oaks, black and sweet gum, dogwood, and some hickory. Among the valuable

grasses naturally growing in fields not tilled may be named broom sedge, Johnson grass, two species of paspalum, and lespedeza. Near the occasional mineral springs and in permanently moist places various good grazing sedges, locally termed "water grass," flourish.

The main crops grown are cotton and corn, with some cowpeas. As may be inferred from the topography and soil, the yields vary greatly with the season, the success of crops depending upon a well-distributed and adequate rainfall. Probably one-fourth bale of cotton and 10 to 15 bushels of corn would represent the average yields over a series of years, although three times these yields have been made by the best farmers.

Large typical bodies of this soil are located near Meridian, Lockhart, Marion, Increase, and Alamucha. Its general extension over the area makes it a soil of much importance.

Plowing seldom goes deeper than 2 or 3 inches. The land should be gradually plowed deeper up to at least 6 or 8 inches. Plowing should invariably be done in the fall, in order to present the subsoil material to the beneficent effect of winter rains and freezes. It would be best to seed to a winter cover crop, such as rye or vetch, to prevent excessive washing. A deeper seed bed would make crops more independent of the effects of prolonged dry weather. The one-horse plow should be supplanted by or supplemented with heavy two or three horse turning plows or disks. Cultivators should be more commonly used on this land.

In order further to lighten the soil and increase its friability, it is necessary to incorporate more vegetable matter, such as cowpeas, vetch, rye, and barnyard manure. The prevalence of erosion is a feature which forces the conclusion that too little attention is being paid to deep plowing, incorporation of vegetable matter, and terracing. The steep slopes should be sodded to Bermuda, reforested, or terraced. Contour plowing is quite generally practiced. Because of the clean cultivation, shallow plowing, and erosion the soil is markedly deficient in humus and inclined to bake in dry weather. The legumes should be given a very much more important place in the agriculture of the type. Liberal applications of commercial fertilizers are profitable for cotton, corn, and oats, especially high-grade mixtures, such as 8–3–3 and 10–3–4.

A considerable portion of the type is at present in unproductive land, valued at from $8 to $15 an acre.

SUSQUEHANNA FINE SAND.

The soil of the Susquehanna fine sand consists of a gray fine sand from 18 to 24 inches deep. A few inches below the surface the color sometimes changes to pale yellow, and usually there is a slight increase in the content of silt and clay toward the lower portion. The

subsoil consists of a reddish to mottled reddish, yellowish and drab or gray plastic clay, corresponding closely to the characteristic subsoil of the Susquehanna series, but averaging slightly more sandy.

The type is most extensively developed in the northern part of the county. It occupies generally the crests of ridges and tops of knolls. It has good underdrainage; in fact, crops are inclined to suffer some for lack of moisture in dry seasons, unless a loamy structure is maintained through the turning under of vegetable matter. A crop of cowpeas plowed under markedly benefits the soil with respect to its capacity for conserving moisture.

Blackjack oaks are conspicuous on the type. Native wild grasses and lespedeza do not thrive as on the heavier types of the series.

The Susquehanna fine sand, when liberally fertilized, produces fairly good crops of corn, cotton, oats, cowpeas, and vegetables. Watermelons, sweet potatoes, and cantaloupes do very well. Better results are had with fertilizers running higher in potash and nitrogen than with those used for the heavier members of the series. Phosphoric acid does not seem to give as good results as on the heavier soils, where this form of fertilizer is needed to hasten development on the colder natured and heavier soils. With proper breaking, frequent addition of vegetable matter, and liberal fertilization the average yield could be increased considerably.

Several areas in the southern part of the county are coarser textured than the average of the type, in places appearing as a medium sand. The areas are so small, however, that it seemed best to include them with the fine sand. This phase occurs in very close association with the Orangeburg and Ruston soils. It is somewhat less retentive of moisture than the typical fine sand and requires more liberal use of organic manures for the conservation of moisture necessary to maintain steady plant growth. Cotton and corn give fair results with liberal fertilization. Vegetables, sweet and Irish potatoes, melons, berries, and peaches do quite well. This type sells for $10 to $15 an acre.

RUSTON FINE SANDY LOAM.

The soil of the Ruston fine sandy loam averages a light fine sandy loam of loose, open structure, rendering it easily tillable under a wide range of moisture conditions. The immediate surface portion is gray in color, while the subsurface to a depth of about 8 to 15 inches is a pale yellow.

The subsoil varies from yellowish-red to dull-red sandy clay, sometimes slightly mottled in lower portions with gray and yellow. It is friable to slightly plastic in structure. The subsoil is intermediate in character between that of the Orangeburg fine sandy loam on the one hand and the Susquehanna and Norfolk fine sandy loams

on the other. It is much less plastic than the Susquehanna, is less red than the Orangeburg, and more nearly red than the Norfolk. Some areas could have been mapped as a sandy loam, but they are of such small extent that it did not seem advisable to show them.

The Ruston fine sandy loam has a general distribution throughout the county, being more extensive in the northern part. It occupies gently rolling uplands and slopes. The resemblance to Orangeburg is usually most strikingly developed on the tops of hills and crests of ridges, while similarity to the Susquehanna is most pronounced along lower slopes. It is derived mainly from the Lafayette formation.

The drainage in both soil and subsoil is very good, except in occasional depressions and on slopes near drainage ways. The type conserves moisture well, though not ordinarily quite so well as the Orangeburg fine sandy loam.

This soil is one of the leading types in Lauderdale County, and when freshly cleared, or when kept well supplied with humus, good crops are secured under a wide range of seasonal variations. Under ordinary conditions one-third to one-half bale of cotton and 20 bushels of corn per acre are fair yields. One successful farmer doubled the above by spacing his corn rows 6 feet apart and growing cowpeas between them, the ensuing crop of cotton being planted where the cowpeas grew the year before.

Because of the tendency to erode, the steeper slopes should be terraced and whenever possible a winter cover crop of oats, rye, or rape grown.

Peaches, plums, and blackberries do well, especially on the ridges or the phase having a friable subsoil. Sugar-cane sirup of good quality can be produced on this soil. It is customary for farmers to select narrow strips of bottom land and moist depressions occurring in the type for sugar cane, but good sirup can be secured from cane grown on any part of the area when liberally fertilized by cotton seed or cottonseed meal, kainit, and acid phosphate, as well as barnyard manure. Mixtures analyzing 8–2–2 applied at the rate of a ton per acre in conjunction with 25 to 50 bushels of cotton seed, or the equivalent in cottonseed meal, and about 5 tons of barnyard manure have been used with much success in the production of sirup upon similar lands. With sufficient rainfall, such fertilization secures a sirup yield of from 150 to 300 gallons, selling at from 45 to 55 cents a gallon.

Fertilizer mixtures analyzing 8–2–2 or 10–2–2 are used for most crops. A few farmers purchase acid phosphate and cottonseed meal and mix their fertilizers at home. Good results are reported from this practice. Where cowpeas have been grown for a few seasons nitrogen need not be applied in large quantities at first. An

acreage application of 75 to 125 pounds of sodium nitrate can very often be used profitably as a later side application to cotton, corn, and sugar cane. A few advanced farmers, by a rotation including a crop of winter oats followed by cowpeas, have increased the productivity of their soil to a point where heavy applications of fertilizers are not needed. By growing legumes in rotation with other crops, plowing deep, keeping the soil well supplied with vegetable matter and moderately fertilizing there should be no trouble in doubling or trebling the average yields.

For general farming the Ruston fine sandy loam is one of the most popular soils in the area and readily brings from $20 to $45 an acre, depending on improvements and distance from shipping points.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Ruston fine sandy loam:

Mechanical analyses of Ruston fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
24730	Soil	0.9	6.8	10.2	33.6	9.8	31.1	7.4
24731	Subsoil	.8	4.9	6.0	28.3	9.3	26.8	23.7

RUSTON SILT LOAM.

The soil of the Ruston silt loam to an average depth of 6 to 8 inches is a gray to grayish-brown silt loam of a mellow, friable structure. The subsoil is a yellowish-red or dull-red silt loam, which lower becomes a silty clay loam. Both soil and subsoil are well drained and retentive of moisture. The type occupies gently rolling locations in the northwestern part of the county, with scattering areas at other points.

The type has not been subjected to the excessive erosion that has lessened the agricultural value of many other soils in the area. It is a very productive type, but, unfortunately, is of limited extent. It is a good general-purpose soil, producing satisfactory yields of cotton, corn, and oats. Its heavy texture fits it for the production of the staple forage crops and cereals.

This soil is capable under proper management of yielding 50 to 60 bushels of corn and a bale of cotton to the acre, although the average yields are at present only one-half as much.

Deep fall plowing should be practiced and winter cover crops grown. Fertilizer applications of a 10–3–3 mixture should be made at the rate of about 400 pounds to the acre for cotton, 300 pounds for corn, and 250 pounds for oats.

The following table shows the results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Ruston silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
24732	Soil	0.5	1.0	1.1	3.9	19.7	66.8	6.8
24733	Subsoil	.0	.8	.6	1.7	17.6	47.0	32.2

RUSTON SAND.

The Ruston sand is a grayish medium sand, which at a depth of 18 to 24 inches passes gradually into a light, friable, dull-red sandy clay loam, occasionally mottled with gray or yellow in the lower portions. In wet locations it is occasionally mottled with gray or yellow at lower depths.

The type is of rather limited occurrence, being generally found in patches along gentle slopes and crests of ridges and the tops of knolls. Typical areas are found near Oak Grove Church and to the east of Increase and north of Lockhart. Limited areas only are under cultivation, the type being mainly forested with scrubby oaks and longleaf pine. It is not considered of great agricultural value, on account of its loose structure and consequent leachy nature. It is much more productive, however, than the Norfolk sand, especially on account of its heavier subsoil. With liberal incorporation of vegetable matter, as cowpeas, rye, and barnyard manure, and heavy applications of fertilizers relatively high in nitrogen and potash fair to good yields of cotton, corn, oats, sweet potatoes, melons, and a number of vegetables are secured. Its agricultural value compares favorably with that of the Orangeburg sand. It is valued at from $3 to $6 an acre.

GUIN STONY SANDY LOAM.

The Guin stony sandy loam is extremely variable both in character of soil material and surface configuration. No definite soil description can be given, inasmuch as the type comprises a number of distinct soils and gradations so intimately associated, patchy in occurrence, and inaccessible as to preclude the separation and mapping of the included types. The surface soil appears most frequently as a grayish sandy loam, broken by the occurrence of clay and clay loam areas. The sandy soil material often extends to a depth of 3 feet or more, but over the greater part of the type a clay subsoil is encountered within the 3-foot profile. Bowlders and fragments of red, reddish-brown, and mottled, iron-cemented sandstone, and

quartzite belonging to the Tallahatta buhrstone formation are of frequent occurrence. Some of the higher ridges and hills and steeper slopes are so stony as to be useless except as pasturage and possibly for fruit growing. Distinct areas of Orangeburg sand, sandy loam, and stony sandy loam, Susquehanna clay, sand, sandy loam, and stony sandy loam are included under the head of Guin stony sandy loam.

The type is derived largely from the Lafayette formation. Topographically it is broken to hilly. There are so many steep slopes and the type is so ramified by deep, narrow valleys of an intricate drainage system that it approaches very nearly the condition of a nonagricultural soil. Some of the hills are in the neighborhood of 200 feet higher than the intervening stream beds. Any agriculture must necessarily be patchy in character. Isolated gentle slopes, low hills, and ridges can be used for peaches, berries, and in a smaller way for vegetables, cotton, and corn. The inaccessibility of such areas often renders their cultivation unprofitable. The type should be left largely in forest and used for pasturage. It is extensively developed in the southern and western parts of the county, considerable areas occurring just south of Meridian. Land of this type is valued at $5 to $8 or $10 an acre.

LAUDERDALE STONY CLAY.

The soil of the typical Lauderdale stony clay consists of a stiff yellow clay carrying on the surface and throughout the soil mass from 25 to 60 per cent of stone fragments consisting of a rather soft, mottled, reddish-gray to nearly white siliceous rock, and to a lesser extent locally formed sandstone resembling quartzite. There is no definite line between soil and subsoil, the latter having about the same characteristics as the former. Some iron-cemented sandstone fragments are also strewn over the surface, representing remnants belonging probably to a former covering of Lafayette, the finer materials of which have been removed by erosion. In places there is a shallow covering of nearly white sand. In places nearly pure quartz sand of reddish to almost pure white color is found in the parent formation in strata of 5 to 15 feet in thickness. This sand is considered valuable for building purposes.

The type is derived from the Claiborne-Tallahatta buhrstone formation and is confined to the southern and western portions of the county. Conspicuous areas are developed in the rolling "mountain" country to the south of Meridian. There are extensive bodies in the vicinity of Meehan Junction, around Lost Gap, and to the northwest of Suqualena.

The greater part of the type occurs as a capping to the highest hills and ridges of the areas. Many of the ridges and hills are very con-

spicuous features, towering considerably above the general upland level. These are commonly called "white hills" and the soil "white hill land" or "white rock land." Some of the highest hills are locally called mountains. The ridges are narrow and winding, with frequent breaks, nearly as in the case of the winding Orangeburg sandy loam ridges. The type also occurs along the steep slopes of ridges and hills capped with Orangeburg soil. Again, some areas occur at relatively low levels where the surface configuration is characterized by knolls and ridges.

The type is mainly timbered with oak, hickory, and shortleaf and longleaf pine. On account of its excessively stony character and steep, broken topography, the greater part of the Lauderdale stony clay can be classed as nonagricultural. Only in a few patches of a less stony phase has any cultivation been attempted. Here cotton was seen this year (1910) to give poor to only fair results. The type is better suited for forestry purposes, and it is valued chiefly for its timber.

NORFOLK SAND.

The Norfolk sand consists of a loose, light-gray sand, averaging 3 feet or more in depth. The subsurface is sometimes of a pale-yellow color, but there is so little difference between the soil and subsoil that a description of the substratum is of more importance than that of the subsoil.

The substratum is somewhat variable in character, ranging from the red sandy clay stratum of the subsoil of the Orangeburg series to the mottled red, yellow, and gray plastic clay encountered in the Susquehanna subsoils. The heavier substratum has considerable influence upon the moisture-holding capacity of the soil. Some patches of coarse sand and fine sand were included with the type on account of their limited extent.

This type occurs in scattered areas on slopes, ridge crests, and hill tops. It is frequently in close association with the Orangeburg sand. It is not an extensively developed soil and is confined mainly to the southern portion of the county. The present timber growth is shortleaf and longleaf pine and scrubby oak.

The Norfolk sand, because of its sloping to hilly and droughty nature, is very little used for agriculture. In order to secure profitable yields, heavy applications of fertilizers high in potash and nitrogen and the liberal incorporation of vegetable matter, as cowpeas, velvet beans, and barnyard manure, would be necessary. Fair yields of cotton and corn can be produced on this type, especially with a well-distributed and liberal rainfall.

With the advent of the boll weevil and the consequent necessity for early cotton in order to curb the ravages of the pest, the Norfolk

sand and other similar sandy soils of the area will probably come into better repute as agricultural soils.

Extra early vegetables for the earliest markets could be grown on this soil in a profitable way where distance to market or shipping station is not too great. Garden peas, radishes, tomatoes, lettuce, and sweet and Irish potatoes would probably give the most profitable returns to market gardeners.

When cleared this type sells for $5 to $8 an acre, depending on value of included adjacent types and improvements.

NORFOLK FINE SANDY LOAM.

The Norfolk fine sandy loam consists of a grayish fine sandy loam underlain at a depth of 8 to 12 inches by friable, yellow fine sandy to silty clay. It occurs in small patches on the gentler slopes and benchlike situations near the foot of slopes and occasionally on the crests of ridges. Only small, widely separated areas occur in the county. This soil is probably derived from the Yellow Loam which formerly covered much of this area.[1] The type is well suited to cotton, sugar cane, oats, corn, forage crops, peanuts, Irish and sweet potatoes, melons, and grass. In its present condition it is very responsive to the use of fertilizers, fall plowing, and the plowing under of vegetable matter. About the same general treatment should be given as recommended on the Ruston fine sandy loam. The yields obtained will average somewhat lighter than those secured from the Ruston fine sandy loam and a little lower than those from the Orangeburg fine sandy loam. The type sells for $15 to $25 an acre.

NORFOLK SILT LOAM.

The Norfolk silt loam is a light-brown or yellowish-brown silt loam averaging about 8 inches in depth. The subsoil is a friable, yellow silt loam to silty clay loam. The soil is easily kept in mellow, excellent seed-bed condition, especially when vegetable matter is occasionally plowed under to replenish the humus content. Where the organic-matter content is permitted to run low the soil runs together in rainy weather and hardens unfavorably in the ensuing dry weather.

The soil has good drainage and yet conserves moisture in amounts sufficient for the needs of crops in periods of protracted drought where proper cultivation is given well-managed fields.

The Norfolk silt loam is mainly confined to the long, narrow strip running north and south through Shucktown. Its topography is flat to undulating, being well suited to the use of improved ma-

[1] Dr. E. N. Lowe and Dr. William N. Logan, of the Mississippi Geological Survey, who visited the area during the survey, saw the Norfolk fine sandy loam, and expressed the belief that it was derived from remnants of the Yellow Loam formation.

chinery. The type undoubtedly represents a derivation of the Yellow Loam formation.

The Norfolk silt loam is one of the best general-purpose soils in the area, and although of limited extent it is practically all under cultivation. Cotton, corn, oats, cowpeas, and garden vegetables, cabbage, tomatoes, and Irish potatoes are grown very successfully. A high state of cultivation has been maintained in the case of this soil by deep plowing and the growing of cowpeas in rotation with other crops. Some commercial fertilizers are used, as is true in the case of all the soils of Lauderdale County. In good seasons 65 bushels of corn and three-fourths bale to 1 bale of cotton are not uncommon yields. Oats and forage crops such as cowpeas and velvet beans give excellent yields.

Land of this type finds ready buyers at prices ranging from $50 to $75 an acre.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Norfolk silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
24712	Soil	0.0	0.4	1.3	15.7	9.1	64.6	8.5
24713	Subsoil	.0	.6	1.5	15.2	8.4	54.8	19.3

OCKLOCKNEE SILT LOAM.

There are two phases of the Ocklocknee silt loam: (1) A brown silt loam having a slightly reddish cast and mellow, friable structure to a depth of 2 or 3 feet, and (2) a grayish-brown to dark-drab silt loam of a stiffer nature and mottled with reddish-brown or rusty brown and dingy drab colors, especially in the silty clay subsoil which is encountered at from 5 to 13 inches below the surface. The brown, mellow phase often continues to a depth of 2 to 3 feet with little change, but frequently has a mottled brown and drab silty clay subsoil below about 2 feet. The Ocklocknee silt loam is most extensively and typically developed in the lowest portions of the larger stream bottoms, usually next to the main channels. Typical areas occur along both Siwashee and Okatibbee Creeks near their point of confluence.

This type is subject to frequent overflow, yet small areas are cultivated to cotton, sorghum, and corn with success, except in years of summer overflows. Protected from overflow by levees and by straightening and deepening of stream channels by dredging, this soil could be used in a highly profitable way for the production of

crops like corn, hay, forage, oats, early maturing varieties of cotton, and sugar cane. Only early maturing varieties of cotton should be grown, because the heavy nature of the soil does not encourage rapid development and maturity. Phosphatic fertilizers would help to force earlier maturity, but under boll weevil conditions good average crops of cotton could scarcely be expected. It is an extremely fertile soil and only needs protection from overflow to be made highly productive. The areas along the smaller streams could be much more easily protected than such bodies as are developed along the Siwashee and Okatibbee.

Profitable yields of hay and fine grazing could be secured even under overflowed conditions. The native "water" grasses, lespedeza, and Bermuda grass could be used to good advantage for hay and pasture. Good grazing can be had from the wild grasses. Lespedeza, carpet grass, and several types of "water" grass flourish on cleared areas.

The larger part of the Ocklocknee silt loam is timbered with beech, sweet gum, black gum, ironwood, pin oak, water oak, and magnolia, with an undergrowth of vines, blackberry bushes, elder, and swamp palmetto.

The surface is flat to undulating. Sloughs and old stream channel depressions are of common occurrence.

Below are given the results of a mechanical analysis of the soil of the Ocklocknee silt loam:

Mechanical analysis of Ocklocknee silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
24716	Soil	0.0	0.1	0.3	4.9	10.4	62.1	22.2

OCKLOCKNEE FINE SANDY LOAM.

The soil of the Ocklocknee fine sandy loam is a light-brown to brown fine sandy loam to heavy fine sandy loam of variable depth. At 6 to 10 inches it frequently begins to assume a mottled coloring of lemon yellow, yellowish brown, rusty brown, and drab. Below this the soil becomes heavier and the mottling is intensified with increase in depth, the subsoil proper being quickly reached. The subsoil is decidedly variable in character. Nearer the large streams it ranges from a rather plastic fine sandy clay, mottled yellow, reddish-yellow, and drab, to very sticky silty clay, also mottled with yellowish, reddish, and drab colors. Along the smaller streams the subsoil averages a fine sandy clay. Here the soil is more of a grayish brown, and yellow and gray are the dominant subsoil colors.

There has been included with this type phases of a fine sandy loam, which resemble, respectively, the Kalmia fine sandy loam and Cahaba fine sandy loam, the one having a yellowish subsoil with slight drab and gray mottling and the other a reddish subsoil. Black iron oxide concretions such as are formed under poor drainage conditions are common to the subsoil. Both the mottling and black iron oxide concretions are indicative of an incomplete stage of weathering, the result of inadequate drainage and consequent poor aeration. Small areas of Bibb fine sandy loam or silt loam also are included. These occur in the occasional depressions and as very flat areas. They have been separated where large enough to map.

The Ocklocknee fine sandy loam is strictly a first-bottom soil. It has been formed by deposition of water-transported material from stream overflow and is still being added to by each inundation. Overflows occur nearly every year. Wash from all the upland soils of the area enters into the makeup of this type, and along the larger streams, as the Okatibbee Creek, alluvial material has been brought in from outside the county limits.

Much of the type is timbered with water oak, pin oak, sweet gum, black gum, beech, willow, and ironwood. It is a very productive soil, yielding under normal conditions of rainfall—that is, when not overflowed or kept permanently soggy by continued rains, 40 to 60 bushels of corn and a bale of cotton or more to the acre with little or no fertilization. The average yields are lower than this, owing to shallow plowing, overflows, lack of ditching, and inefficient cultivation of crops. It is considered better for cotton than corn, but both crops do well. A variety of grasses and forage crops, oats, cowpeas, sorghum, and lespedeza could be made to afford good grazing and give heavy yields of hay. A number of native grasses furnish excellent pasturage.

Very good sugar-cane sirup is secured with yields heavy enough to force the conclusion that this type offers an excellent opportunity for extending the sirup industry. Applications of lime would help some of the poorer drained areas, once better drainage is established by opening ditches, as an improved condition of the soil for crops would result. Phosphoric acid is needed to hasten crops, especially cotton.

Much protection against overflow could be secured by straightening and deepening the stream channels. In some of the wider bottoms diking undoubtedly could be done in a profitable way. The type is extensively developed throughout the county as narrow stream bottoms and bottoms wide enough to make up an important proportion of the land, including many farms lying along the larger streams. Often planting is delayed in the spring, owing to the poorly drained condition of the soil, a handicap that could be made of much less importance by ditching.

OCKLOCKNEE CLAY.

The Ocklocknee clay consists of a dark-gray to black stiff clay to silty clay loam, underlain at from 6 to 20 inches by plastic clay, mottled brownish, yellowish, and gray or drab. Small buckshotlike black iron concretions are common on the surface and throughout the soil mass of the black phase. Owing to the imperviousness of the clay subsoil, especially in the areas having a stiff black clay soil, underdrainage is poor and crops are apt to suffer severely in wet years. The structural conditions would be improved by fall plowing and liming at the rate of 1 ton of burnt lime per acre.

Both cotton and corn are grown on this soil, excellent yields being made in dry years, particularly on the light-colored silty clay loam phase. Crops suffer on the black phase in protracted droughts, when the soil bakes severely. Grass does very well.

Only small patches of this type have been mapped. These occur in the first bottoms of the larger streams and are subject to overflow. The black phase was encountered in a small body on the forks of Siwashee and Okatibbee Creeks near the point of their confluence. Areas of the grayish phase were mapped in the Chunkey Creek bottoms near the Clarke County line and in the Buckatanna Creek bottoms. The largest area is the one to the southwest of Russells Store on Okatibbee Creek.

OCKLOCKNEE SAND.

The Ocklocknee sand consists of a grayish to yellowish-brown loose medium sand, underlain at from 4 to 8 inches by a lighter-colored sand of practically the same texture and structure. The type is usually underlain by plastic clay at a depth of 6 to 10 feet.

The surface is nearly flat, excepting for occasional sand dunes. In many parts of the river bends the recently deposited white sands would have been mapped as Riverwash had the areas been of sufficient size.

The Ocklocknee sand occurs in the first bottoms of Chunkey Creek, which flows across the southwestern corner of the county. Large typical areas are found near Point. The type supports a rather thin growth of longleaf pine, scrubby pine, and a scattering undergrowth, consisting largely of gallberry bushes. This type runs mainly to timber, only one small patch being cultivated. This produced in 1910 a small crop of cotton.

On account of its sandy nature this soil can not be expected to give heavy yields without heavy fertilization and incorporation of vegetable matter.

The type is best suited to the production of melons and early vegetables.

BIBB FINE SANDY LOAM.

The Bibb fine sandy loam consists of a light-gray to nearly white fine sandy loam, underlain at from 6 to 12 inches by nearly white sandy silt loam to silty clay, mottled with yellow and red. Black iron oxide concretions are of common occurrence in the subsoil. This type of soil is locally designated "crawfish land," or "white sandy bottoms."

The type occurs as almost perfectly flat, first-bottom areas, subject to overflow. It is found in the bottoms of nearly all streams, but not always in sufficient areas to be mapped separately from other types. Some quite extensive areas occur along Ponta and Okatibbee Creeks.

On account of the low average yields secured, very little of the type is under cultivation, the greater proportion being covered by a heavy growth of white oak, water oak, beech, bay, sweet gum, black gum, maple, ironwood, willow, and shortleaf pine. Native grasses and lespedeza afford an excellent grazing sod, especially in cleared areas. Carpet grass and several species of "water" grass flourish on this soil.

The Bibb fine sandy loam can be profitably used for pasturage and the production of hay, sorghum, and sugar cane. Cotton and corn give poor average results, the former probably doing better. Phosphoric acid would hasten maturity and could probably be used profitably where cultivated crops are grown. A heavy application of burned lime would improve the soil structure and prove otherwise ameliorative.

For general farm crops, corn, oats, cotton, and forage the land should be ditched and limed. Rough vegetable matter plowed under in the fall would assist in bringing about a good condition for crop growth. In its present condition it is best suited to pasturage.

BIBB SILT LOAM.

The Bibb silt loam consists of a light gray to nearly white silt loam, underlain at from 6 to 10 inches by nearly white, stiff silty clay loam to silty clay, mottled with yellow. Black iron-oxide concretions are encountered in the subsoil. Land of this kind is locally styled "crawfish land," or "white bottom land."

The type occupies almost perfectly flat areas in the overflowed first bottoms of streams. Its timber growth is about the same as that on the Bibb fine sandy loam. Very little of the type is cultivated, though much of it is profitably used for pasturage. The type could also be used profitably for the production of hay. Lespedeza and native grasses, especially carpet grass and water grass, do even better than on the Bibb fine sandy loam.

Like the fine sandy loam member of the series, the type needs drainage, liming (1 to 2 tons per acre of burnt lime), and liberal addition of vegetable manures. Handled in this way oats, corn, sugar cane, and forage crops could be profitably grown. For cotton heavy applications of phosphoric acid would be beneficial in hastening maturity.

The type is sparingly developed in narrow strips of bottom land. A number of areas of fair size occur in the bottoms of Siwashee and Okatibbee Creeks near their point of confluence.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Bibb silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
24740	Soil	0.7	2.4	2.9	12.6	10.2	59.7	11.2
24741	Subsoil	.8	4.3	5.2	19.1	12.3	47.3	11.1

MEADOW.

Under the name "Meadow" have been included poorly drained and comparatively narrow strips of stream-bottom land in which the soil material is so variable in texture and character as to make a satisfactory separation and mapping of the included soil types impossible. Sands, loams, silt loams, and clays often occur in small areas in very intimate association.

There is also considerable variation in material from the surface downward, the latter being a sandy loam or sand in one place and a clay or silt loam at a distance of only a few feet. Very often strata of sandy material are included in silt loam subsoils, and vice versa. The color of the subsoil, while extremely variable, is predominantly mottled gray, yellowish, and bluish. Areas having white and blue subsoil are commonly styled "crawfish land." Small patches of Muck, Ocklocknee, and Bibb soils are comprised in this type.

The type is confined to frequently overflowed first bottoms, where permanently saturated or soggy conditions generally obtain. Occasional patches have been ditched and put under cultivation to sugar cane, sorghum, corn, and cotton. The whole of the type can be reclaimed by deepening and straightening stream channels and by digging lateral ditches through to the foot of the adjacent slopes. Ditches around the foot of the slope would also be necessary in many areas. An acreage application of 1 to 2 tons of burnt lime should be made on the heavier areas containing clay, silt loam, and loam patches.

The reclamation of the Meadow lands of Lauderdale County offers an excellent opportunity for the acquisition of additional land, well suited, under proper management, to corn, sugar cane, sorghum, grass, and forage crops. Cotton also could be profitably grown, especially with the addition of phosphatic fertilizers. There are many strips too narrow or too inaccessible to admit of profitable reclamation, but a large number of farms would be enhanced in value and made more sanitary through the drainage and utilization of these alluvial soils. Without any very extensive efforts at drainage a large proportion of the type could be put in condition to furnish good wild-grass pasturage and hay. Bay, willow, maple, black gum, sweet gum, magnolia, elder, alder, "buttonwood" bushes, and blackberry bushes constitute the main growth.

CAHABA FINE SANDY LOAM.

The soil of the Cahaba fine sandy loam to a depth of some 8 to 20 inches is a grayish-brown, mellow fine sandy loam to heavy fine sandy loam. The subsoil is a friable to slightly plastic fine sandy clay, varying in color from a yellow of faint reddish cast to reddish brown or dull red. Slight mottling is sometimes noticeable in the lower portion of the subsoil in the poorer drained sections.

The Cahaba fine sandy loam occurs mainly on second and third stream terraces of flat to slightly billowy surface configuration. The distinct terrace phase is known locally as "second bottom." The material was deposited here before streams had cut their channels to present levels, when the flood plain was much wider than at present. A considerable part of the city of Meridian is built upon an old terrace of Siwashee Creek, consisting of Cahaba fine sandy loam. These terraces lie either entirely above overflow or above normal overflow. Some of the type is developed in the high bottoms of a number of small streams, not strictly as terraces, but in situations above ordinary overflow. Again, some narrow ridges of this soil have been mapped near the banks of the larger streams, like the Okatibbee. In such situations, as well as over some of the lower terraces and high bottoms, occasional overflows do occur. A soil very much like the Cahaba fine sandy loam, especially in the color and character of the subsoil, is encountered occasionally in the first bottoms; but on account of its frequent inundation and addition of alluvial material, such land has been included with the Ocklocknee fine sandy loam.

The Cahaba fine sandy loam is the best all-around agricultural soil derived from stream-deposited material. The greater part has good drainage, while the soil, in both texture and structure, is admirably suited to the conservation of moisture in amounts most favorable to steady plant growth, even throughout protracted droughts. Poor

structural conditions favoring excessive loss of moisture through surface evaporation may be induced through careless soil management. With deep, thorough fall plowing and crop rotations, including crops supplying vegetable matter to the soil, the type can easily and inexpensively be maintained in a most excellent condition of tillage.

Under good management corn should yield from 40 to 60 bushels or more; cotton, three-fourths bale to 1 bale; oats, 40 to 50 bushels; and cowpeas, 1 to 2 tons of hay per acre. Sugar cane gives especially good results, making a sirup of good quality. A great variety of vegetables—string beans, Lima beans, radishes, lettuce, eggplant, cauliflower, cabbage, tomatoes, beets, watermelons, cantaloupes, squash, pumpkins, sweet and Irish potatoes, peppers, and okra—do well. There are good opportunities for the production of peaches, summer apples, pecans, and brier fruits. High-grade fertilizers can be used profitably, for vegetables especially.

Acreage applications vary with the condition of the soil and the kind of crop. As much as a ton per acre could be used for crops like cabbage, lettuce, and potatoes on land that has not been liberally treated with respect to manurial application in the past. Where the soil is well supplied with organic matter lighter applications are necessary. Phosphoric acid is very effective on soil of this character, especially in hastening crops to maturity.

There are good opportunities to develop profitable general farming or dairying industries on the Cahaba fine sandy loam. The greater part of the type is under cultivation, the remainder being timbered principally with water oak, pin oak, black gum, sweet gum, pine, and magnolia.

The trucking industry is most extensively developed in the vicinity of Meridian on the Cahaba fine sandy loam. A number of wild grasses and lespedeza afford good grazing.

The type sells for $15 to $50 an acre, depending upon location.

CAHABA SILT LOAM.

The Cahaba silt loam consists of a brown to grayish-brown silt loam of a floury feel, underlain at about 8 to 15 inches by a yellowish-brown to dull red, moderately friable silty clay.

The soil is inclined to compact and bake in dry weather unless deeply plowed and kept supplied with a moderate amount of organic matter. Newly cleared areas have a quite loamy soil and can be kept in such condition easily by practicing rotations, including the legumes.

The type occupies flat stream terraces lying above normal overflow. A few patches have a slight slope streamward and some occur as higher bottoms, not inundated except during freshets. Some of the

type could be improved by ditching to prevent standing surface water and to supply good underdrainage.

The Cahaba silt loam is well adapted to corn, cotton, forage crops, grass, oats, sugar cane, and late truck crops, like cabbage, tomatoes, cauliflower, bunch beans, Lima beans, and Irish potatoes. Lespedeza and a number of wild grasses afford excellent grazing. The type could be successfully used for the production of hay. Pecans, plums, strawberries, and bramble berries would do well.

Heavy general farming, special truck farming, and dairying are the lines of agriculture that offer the most attractive inducements on this type. Phosphatic fertilizers are needed, especially in the case of cotton, to hasten maturity. An acreage application of 1 ton of burnt lime would probably show decided improvement in the structure of the soils. Ditching is necessary to improve the surface drainage of some of the more nearly level areas.

KALMIA FINE SANDY LOAM.

The soil of the Kalmia fine sandy loam consists of a grayish-brown fine sandy loam, ranging ordinarily from 8 to 14 inches in depth. The subsoil is a yellow, slightly plastic fine sandy clay, mottled usually with drab and gray, especially in the lower portion. It is typically developed on the second bottoms or high bottoms, lying either entirely above overflow or above normal overflow. As with the Cahaba fine sandy loam, soil very similar to this is frequently encountered in the first bottoms of streams. Such areas have been included with the Ocklocknee fine sandy loam, although they really are more like the Kalmia fine sandy loam. The type is alluvial in origin and is closely related to the Cahaba fine sandy loam, the essential difference being the light-colored mottled subsoil resulting from the poorer drainage conditions obtaining over the type and the consequent lower agricultural value. On some of the better drained areas near the occasional drops to lower levels the subsoil is more nearly yellow in color, sometimes making the type very similar to the Norfolk fine sandy loam. Where the drainage is good or is made by ditching good crops of corn, cotton, and sugar cane are secured. Oats, sorghum, cowpeas, wild and cultivated grasses, and lespedeza do very well. Vegetables do not give as good results as on the Cahaba fine sandy loam, but they can be grown successfully, especially when the soil is well drained. Pecans would give good results.

In the handling of this soil the first requisite is drainage. This can be established most cheaply by ditching. There would be little difficulty in determining the proper place for the ditches, as the type occurs as comparatively narrow strips lying between the foot of the uplands and lower levels, a position that readily suggests the general

plan of drainage suited to individual areas. Some of the narrower strips will simply need a ditch following along the foot of the upland slopes, where the lighter colored soil and sometimes slightly depressed surface immediately suggests the need of a ditch. Other almost perfectly flat areas need only an occasional ditch from the foot of slopes across the type to remove surface water and to facilitate underdrainage.

The Kalmia fine sandy loam needs humus. It is markedly improved by growing the legumes, cowpeas, velvet beans, and bur clover. Cowpeas sown between corn at the last cultivation make good growth and improve the soil greatly, in addition to affording excellent grazing for cattle.

Much of the type supports a growth of pin oak, water oak, black gum, sweet gum, willow, bay, magnolia, and pine. Swamp palmetto is seen occasionally on the poorer drained areas. The type is held at prices ranging from $5 to $20 an acre.

KALMIA SILT LOAM.

The Kalmia silt loam consists of a grayish-brown silt loam, underlain at from 8 to 12 inches by yellow silt loam to silty clay loam, mottled with gray or drab and light yellowish colors.

The soil is typically developed on second terraces and high bottoms lying above normal overflow. Soil of very much the same characteristics is encountered in the overflowed first bottoms, such areas being included with the Ocklocknee silt loam.

The Kalmia silt loam is best suited to the production of corn, oats, sugar cane, sorghum, grass, and forage. Cotton does fairly well, but is apt to mature late. Phosphatic fertilizers would remedy this. In its present condition the type is best suited to pasturage and hay.

Drainage, applications of burnt lime (1½ tons to the acre), deep plowing in the fall, and liberal addition of vegetable matter, cowpeas, or barnyard manure would greatly enhance the agricultural value of the type.

There is only a small total area of the type in the county, and it is not considered a very important soil.

SUMMARY.

Lauderdale County lies in the east-central portion of Mississippi and has an area of 708 square miles, or 453,120 acres. It falls within the region of the Gulf Coastal Plain and its soils are consequently of sedimentary origin.

The surface configuration of the uplands varies from flat to gently undulating or rolling to hilly and ridgy. The stream bottoms and second bottoms are prevailingly flat.

The area is well drained by numerous creeks and streams, which have bottoms that are comparatively wide in proportion to the size of the streams. Meridian, the county seat and largest city in the State, with a population of 23,285, has many factories. Lauderdale is one of the few counties in the State where the manufactures far exceed the agricultural output.

The county has excellent railroad communication with outside points and competitive freight rates. It has numerous artesian wells and mineral springs.

The Norfolk silt loam is the most valuable member of this series and is suited to intensive agriculture. The Norfolk fine sandy loam is a quick, responsive soil, capable of great improvement. The limited areas of Norfolk sand are well suited to systematic forestry.

The Orangeburg sand, fine sand, and coarse sand are suited to peach growing and fruit production, although not so well adapted for this purpose as are the sandy and fine sandy loams. The Orangeburg sandy and fine sandy loams are very popular soils when level enough to be cultivated. Peaches are raised commercially on these types and an excellent quality is secured.

The Susquehanna fine sand is found in limited areas and demands constant fertilization and a high state of culture in order to produce good crops. The Susquehanna fine sandy loam is extensively developed. It is rather a difficult soil to handle in order to get the best results. Under favorable conditions it produces good crops of cotton, corn, and forage. Much of the Susquehanna clay is non-agricultural land and those portions tilled demand careful treatment in order to prevent destructive erosion and to maintain the necessary condition of tilth.

Meadow is well adapted for timber lands and pasture. When cleared and drained it yields good crops of sugar cane, corn, grass, oats, and forage crops.

The Cahaba soils are second-bottom lands lying mainly above overflow lines. The fine sandy loam is well suited to cotton, corn, oats, forage crops, and grass.

The Kalmia soils are also developed on the second bottoms. They are not so well drained as the Cahaba series, but can easily be made profitable through drainage. These soils are quite similar to the Cahaba in crop adaptation, though not so productive.

The Ocklocknee soils are developed in the overflow bottoms of streams. The various types are adapted to grass, forage crops, and corn. With the establishment of better drainage conditions yields would be surer.

The Bibb soils are also developed in the overflow stream bottoms. They are admirably adapted to grass and lespedeza. With better drainage corn and forage and other crops could be successfully grown.

The Lauderdale stony clay, Guin stony sandy loam, and badly eroded areas of various types are better suited to forestry and Bermuda pasturage.

Lauderdale County embraces a large area of soils variously suited to cotton, corn, sugar cane, oats, forage crops, peanuts, peaches, plums, pecans, vegetables, melons, and sweet and Irish potatoes. With deep, thorough breaking, shallow cultivation, frequent incorporation of vegetable matter, the rotation of crops so as to include the legumes, and moderate to liberal applications of the better grades of commercial fertilizers or home-mixed fertilizers, profitable yields can be easily and regularly secured. There are excellent opportunities for profitably increasing the acreage of a number of crops, as sugar cane for sirup, forage crops for stock, peanuts for hogs, and sweet potatoes, melons, and vegetables for shipment.

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U. S. DEPT OF AGRICULTURE
BUREAU OF SOILS
MILTON WHITNEY, CHIEF
CURTIS F. MARBUT, IN CHARGE SOIL SURVEY

SOIL SURVEY
LAUDERDALE COUNTY SHEET

STATE GEOLOGICAL SURVEY

SOIL PROFILE
(3 feet deep)

Orangeburg coarse sand — Cs
Norfolk fine sandy loam — Fsl, Fsc
Orangeburg sand — S, Sc
Norfolk silt loam — Sil
Orangeburg fine sand — Fs, Fsc
Ocklocknee sand — S
Orangeburg sandy loam — Sl, Sc
Ocklocknee fine sandy loam — Fsl, Fsc to Sic
Ocklocknee silt loam — Sil, Sic
Erosion phase
Orangeburg fine sandy loam — Fsl, Fsc
Ocklocknee clay — Sic
Susquehanna fine sand — Fs, C
Bibb fine sandy loam — Fsl, Sic
Susquehanna fine sandy loam — Fsl, Fsc, C
Bibb silt loam — Sil, Sic
Susquehanna silt loam — Sil, C
Kalmia fine sandy loam — Fsl, Fsc
Susquehanna clay — Hfsl, C
Kalmia silt loam — Sil, Sicl
Ruston sand — S, Sc
Guin stony sandy loam — Sl, C
Ruston fine sandy loam — Fsl, Fsc
Lauderdale stony clay — Fsl, C
Ruston silt loam — Vfsl, Sic
Cahaba fine sandy loam — Fsl, Fsc
Norfolk sand — S
Cahaba silt loam — Sil, Sic

LEGEND

Cs Coarse sand
S Sand
Sc Sandy clay
Fs Fine sand
Fsc Fine sandy clay
Sl Sandy loam
Fsl Fine sandy loam
C Clay
Sil Silt loam
Hfsl Heavy fine sandy loam
Vfsl Very fine sandy loam
Sic Silty clay
Sicl Silty clay loam
Csc Coarse sandy clay

Hugh H. Bennett, Inspector in charge

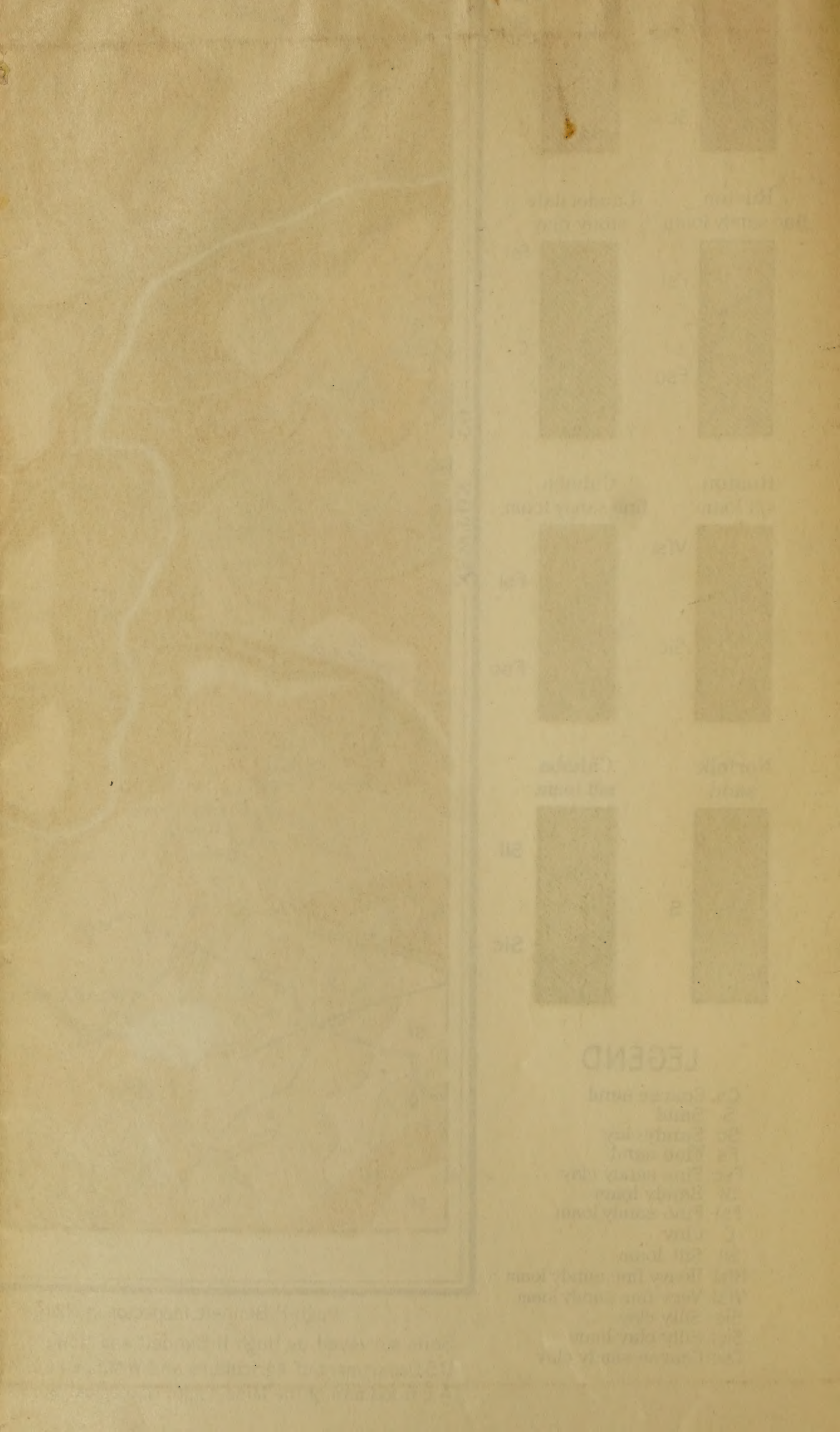
Soils surveyed by Hugh H. Bennett and Howard C. Smith of the U.S. Department of Agriculture and W. M. Spann, E. M. Jones and A. L. Goodman of the Mississippi Geological Survey

Scale 1 inch = 1 mile

Field Operations
Bureau of Soils
1910

LEGEND

Orangeburg coarse sand — Oc
Norfolk fine sandy loam — Nf
Orangeburg sand — Os
Norfolk silt loam — Nsl
Orangeburg fine sand — Ofs
Ocklocknee sand — Oc
Orangeburg sandy loam — Ol
Ocklocknee fine sandy loam — Of
Ocklocknee silt loam — Ocl
Erosion phase
Orangeburg fine sandy loam — Osl
Ocklocknee clay — Ok
Susquehanna fine sand — Ss
Bibb fine sandy loam — B
Susquehanna fine sandy loam — Sf
Bibb silt loam — Bl
Susquehanna silt loam — S
Kalmia fine sandy loam — Kl
Susquehanna clay — Sc
Kalmia silt loam — Ks
Ruston sand — Rs
Guin stony sandy loam — Gs
Ruston fine sandy loam — R
Lauderdale stony clay — Lc
Ruston silt loam — Rl
Cahaba fine sandy loam — Cf
Norfolk sand — Ns
Cahaba silt loam — Cs
Meadow — M



[PUBLIC RESOLUTION—No. 9.]

JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided*, That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the Congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils.]